

X-542-64-248

TM X-55096

N64-33622

(ACCESSION NUMBER)

110
(PAGES)

(THRU)

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(CODE)

20
(CATEGORY)**NASA TM X 55096**
(NASA CR OR TMX OR AD NUMBER)

FACILITY FORM 602

CAMEO**COMPUTER-INDEPENDENT ABSTRACT
MACHINE-LANGUAGE ENCODER AND OPERATING-SYSTEM****UNIVAC 1107 USAGE**

OTS PRICE

\$

4.00

\$

.75

XEROX

MICROFILM

AUGUST 31, 1964**NASA****GODDARD SPACE FLIGHT CENTER****GREENBELT, MD.**

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CAMEO

Computer-independent Abstract
Machine-language Encoder and Operating-system

Univac 1107 Usage

S. A. Richmond

J. L. Maury

P. H. McClain

INTRODUCTION

The Cameo System as available on the Univac 1107 Thin-film Computer will be described in this report. Neither the philosophy of the system nor its basic structure have been changed. It is still an encoder for the Mystic abstract machine with the only difference occurring in the machine language generation for the underlying computer. A complete listing of the Sleuth II program which does the encoding and a flow diagram of that program are attached to provide answers to any questions that may arise about error recovery, I/O operations and floating point adjustments. It is not necessary to be familiar with the Univac 1107 to use this system, but the listing and diagram are provided for those who are interested in the details of the encoding system.

This paper will be confined to the documentation of information necessary for the compiling and operation of Cameo programs on the Univac 1107.

COMPILER INFORMATION

Notation

- Cameo Tape—Encoder tape
- Mystic Program—Input program
- Machine Language Program—Resulting program
- Error Halts—Programmed Cameo stops resulting from erroneous codes, etc.
- Bootstrap—Self loading program initiated by Bootstrap button on console.
- Jump Switch—One of 15 switches on console which may control programmed transfers.

<u>Tape Set-up</u>	<u>Channel</u>	<u>Unit</u>
Cameo Tape	2	0
Mystic Program	2	1
Blank (for machine language program)	2	2

	<u>Channel</u>	<u>Unit</u>
<u>Card Set-up</u>	12	0
	(Card Reader)	

Console Set-up

<u>Jump Switch</u>	<u>Disposition</u>	<u>Interpretation</u>
15	off	Mystic Program on tape.
15	on	Mystic Program on cards.
14	off	Encode and execute Mystic program.
14	on	Encode Mystic program and write machine language on Uniservo 2-2.
13	off	Leave 2-1 in position after reading.
13	on	Rewind 2-1 after reading.
12	off	Halt if coding error detected. Type out error on console.
12	on	Type out error on console. Continue encoding.
11	off	Clear core memory before encoding begins.
11	on	Do not clear core memory before encoding.
10	off	Execute the generated machine language program immediately after encoding.
10	on	Halt for type in after encoding is complete.

Console Disposition

Clear Computer
 Master Clear
 Clear I/O channels 2 thru 15
 Bootstrap from 2-0

Halts for Jump Switch 12 (Detailed explanation follows)

1. Servo Error
2. Address Too Large
3. Illegal Operation
4. Too Many Q's
5. Core Memory Exhausted
6. EOF on Mystic Tape
7. Interlock CC

The error stops listed above are printed on the console typewriter at the time of the error. Each type out includes the line number of the Mystic command found to be erroneous.

1. Servo Error

Line xxxxxx₁₀

(a) Mystic tape is bad.

NOTE: This stop may also occur during execution of the compiled program, in which case it means the data tape being handled is bad.

(b) Uniservo trouble.

Switch units and try again. If no success, call C.E.

2. Address Too Large

Line xxxxxx₁₀

One of the addresses in the Mystic command being compiled is larger than the available core storage references. Usually occurs due to failure of programmer to use a Q command.

3. Illegal Command

Line xxxxxx₁₀

A command not in the CAMEO repertoire has been used.

4. Too Many Q's

Line xxxxxx₁₀

More than 125 entries have been made in one Q table.

5. Core Memory Exhausted

Line xxxxxx₁₀

The amount of machine language generated exceeds 32,000 instructions.

6. EOF on Mystic Tape

Line xxxxxx₁₀

The transfer card or dot card is missing from the end of the Mystic Program tape.

7. Interlock CC

An interlock has occurred on channel CC. If channel is a uniservo, the operator must correct the situation manually and the program should be started from the beginning. If the channel is the card reader, the operator should reset the card reader and type in = RES and the program will restart itself.

NOTE: This Stop is not contingent upon jump switch 12.

PROGRAM SET UP AND OPERATING INSTRUCTIONS

Program Set Up

(a) Machine language program tape	2 - 0
(for production run or check	
run on debugged program)	
(b) Cameo tape	2 - 0
Mystic program tape (if any)	2 - 1
Mystic program deck (if any)	12 - 0
	(Card Reader)

Data Set Up

<u>Mystic Reference</u>	<u>1107 Channel and Unit</u>
TA	3 - 0
TB	4 - 0
TC	3 - 1
TD	4 - 1
TE	3 - 2
TF	3 - 3
TG	3 - 4
TH	3 - 5
TI	2 - 4
PA	Printer 13 - 0
CA (Punch)	4 - 3
CA (Read)	Card Reader 12 - 0

Console Operation

Master clear

Computer clear

Clear I/O channels 2 thru 15

Set up to bootstrap from channel 2 unit 0

Push bootstrap button to begin operation

Use typewriter for any interrupts or transfers at halts. (See
Typewriter Operating Instructions)

TYPEWRITER OPERATING INSTRUCTIONS

The typewriter is available for program interrupt during execution and for obtaining dumps after normal stops or error halts.

Jump switch 10 is used to halt a program during execution if a message is to be sent. Failure to send a message after interrupting the program forces a timeout of IDLE, and the computer is forced onto a loop. The program may be resumed at any time by sending the RES message. Jump switch 10 must be off when this is done.

AVAILABLE TYPEWRITER MESSAGES

(1) = RES

Resume operation of program at instruction waiting to be executed when interrupt occurred.

(2) = EOFbCUU

Write an EOF on unit UU of Channel C.

(3) = TRAbxxxxxx₈

Each typed message must be followed by turning off jump switch 10 and hitting the return key. Otherwise the computer sits in a loop.

The TRA should be used to obtain Memory Dumps after a normal completion or an error halt.

AVAILABLE TYPEOUTS

(1) ENDxxxxx PATHFINDER READS xxxxx

Any stop, normal or error, causes the above typeout. This typed message should be returned, along with any other typeouts and the results of the run, to the programmer.

1107 — 7094 REFERENCES

For ease in transfer of run set-up from the 7094 to the 1107, the following references are provided:

(1) Tapes

<u>Mystic Reference</u>	<u>7094</u>	<u>1107</u>
TA	B1	3 - 0
TB	C1	4 - 0
TC	B2	3 - 1
TD	C2	4 - 1
TE	B3	3 - 2

Mystic Reference

7094

1107

TF

B4

3 - 3

TG

B5

3 - 4

TH

B6

3 - 5

TI

A5

2 - 4

A1

2 - 0

A2

2 - 1

A3

2 - 2

(2) Switch Settings

7094

1107

40

15

30

14

20

13

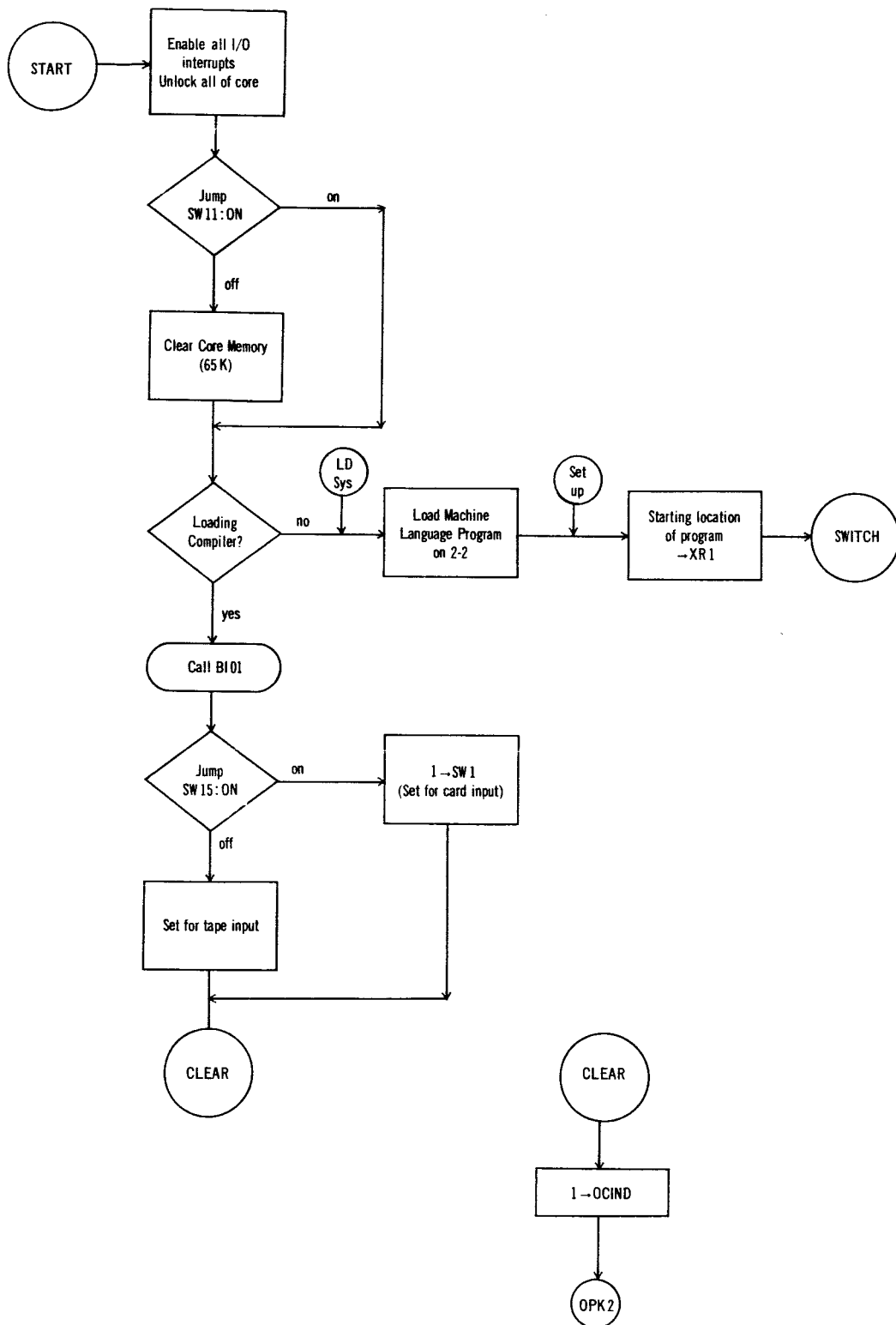
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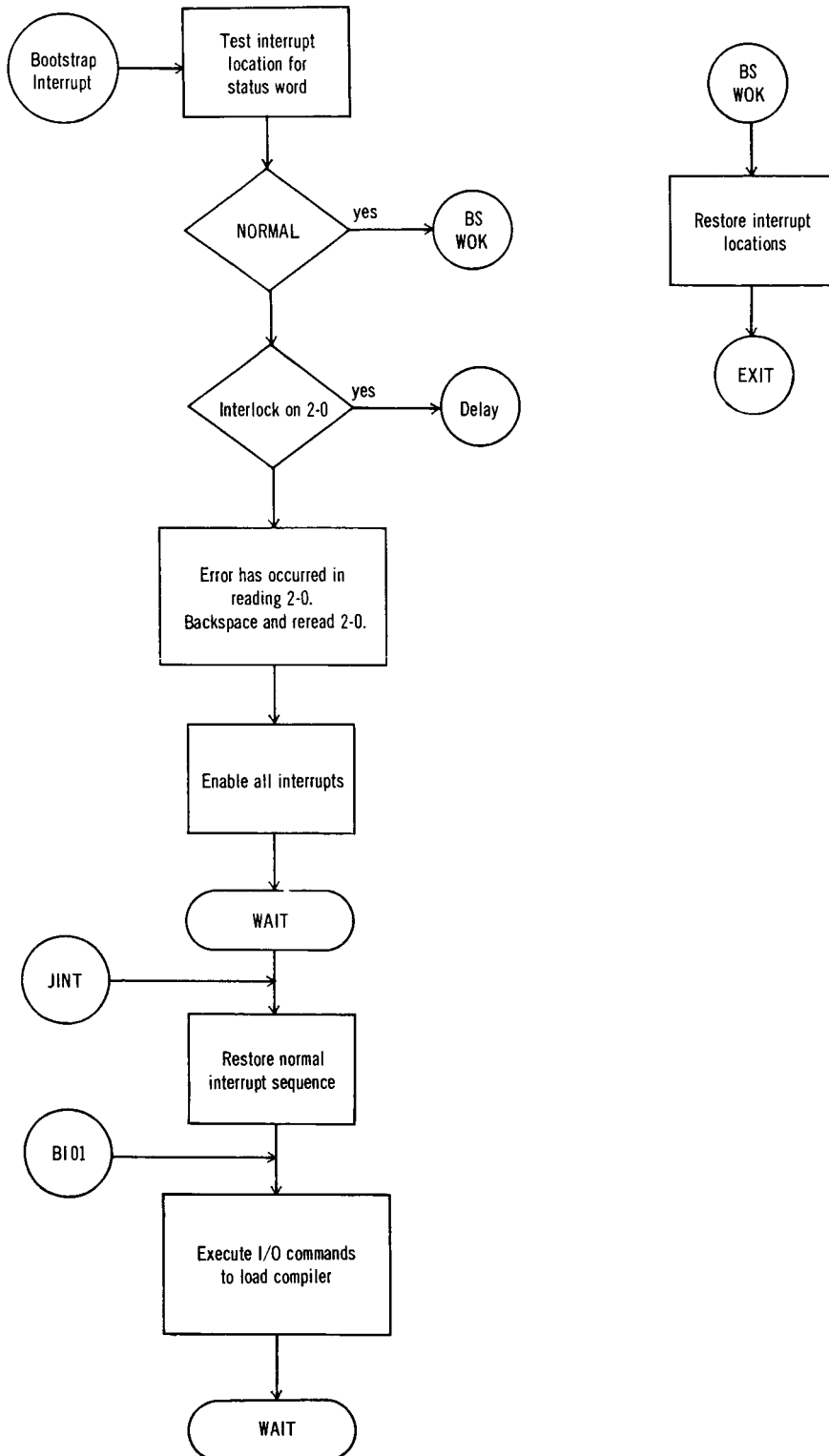
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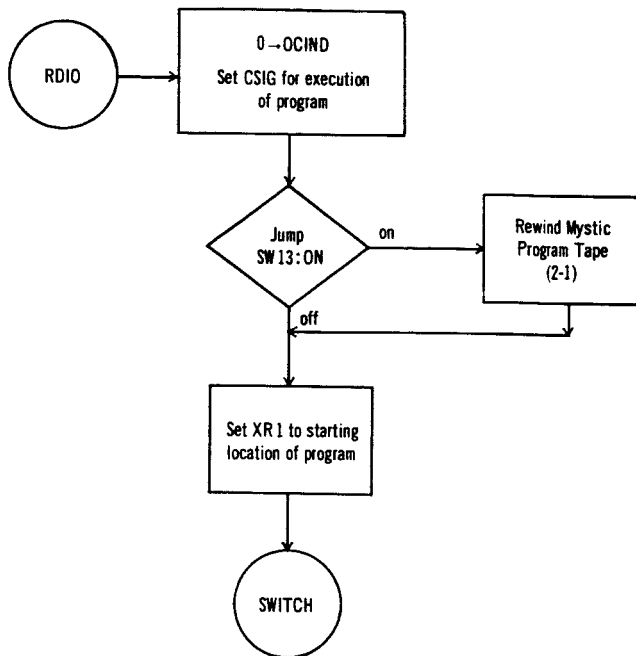
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11

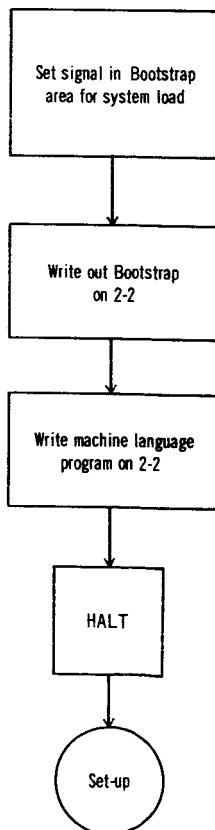
Appendix I
Flow Diagrams



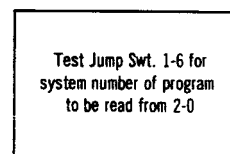




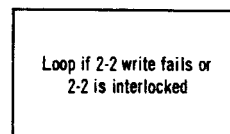
WRTA3

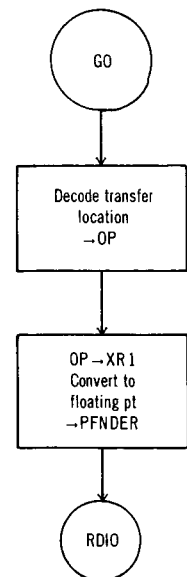
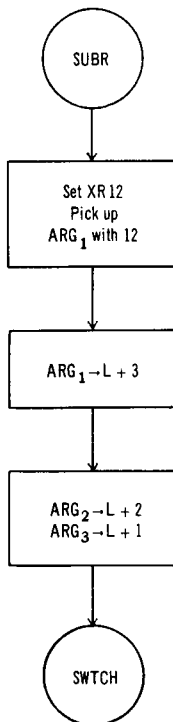
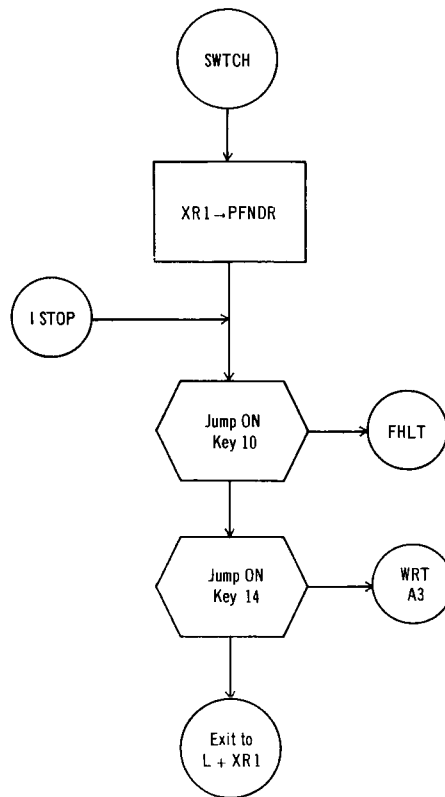


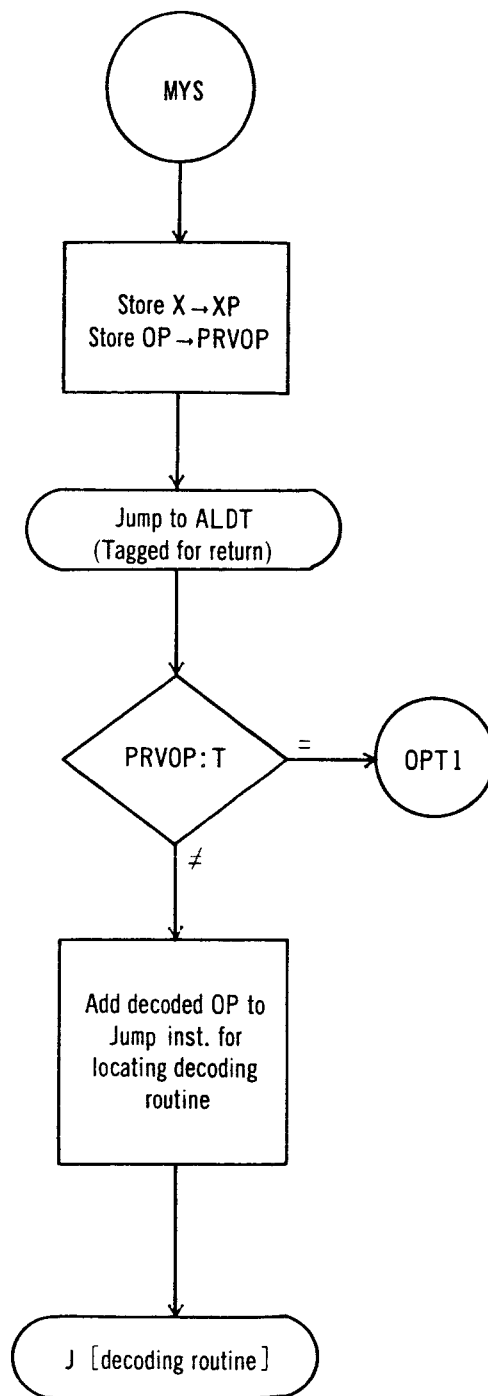
Sysno



Delay

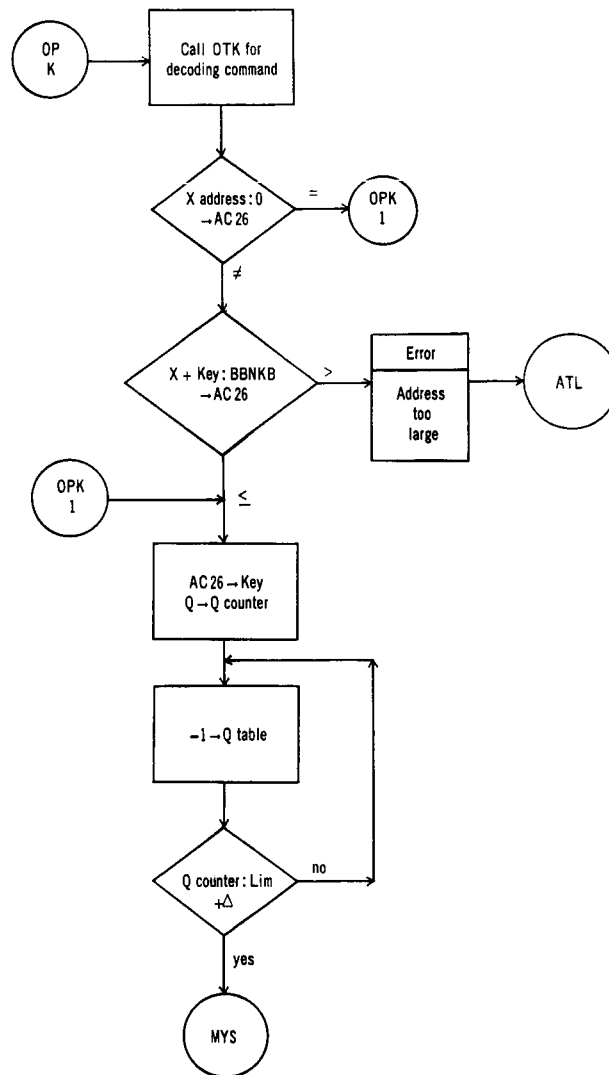
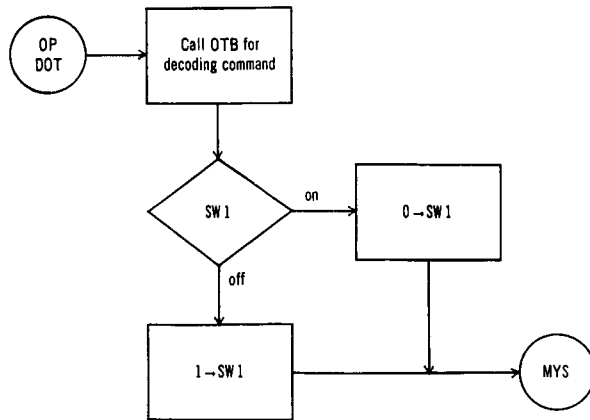




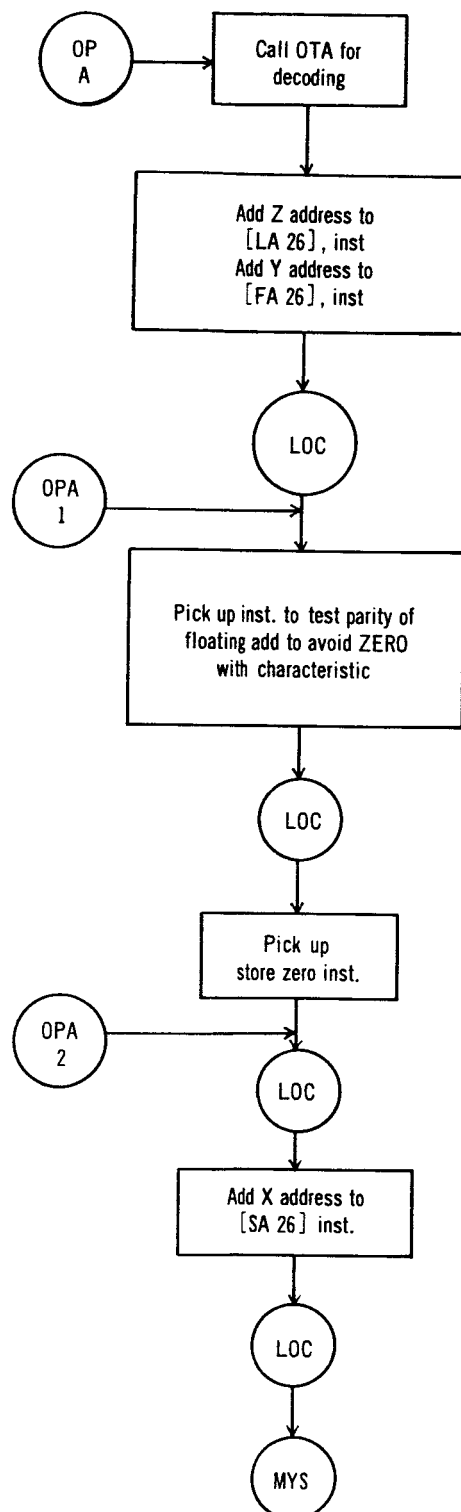


NOTE: There is one decoding routine for each Mystic OP.

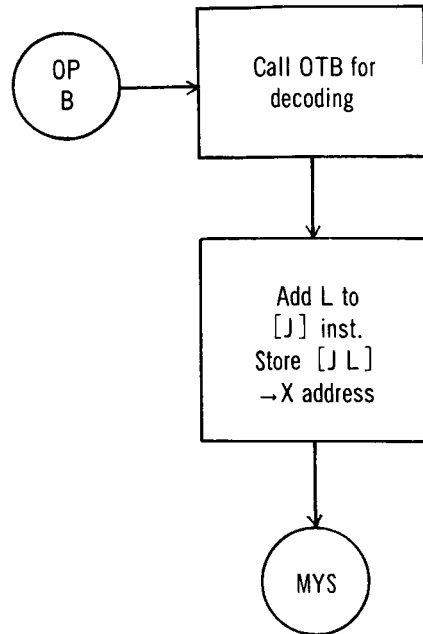
OPA, OPB, OPC, ..., OPZ, OP3



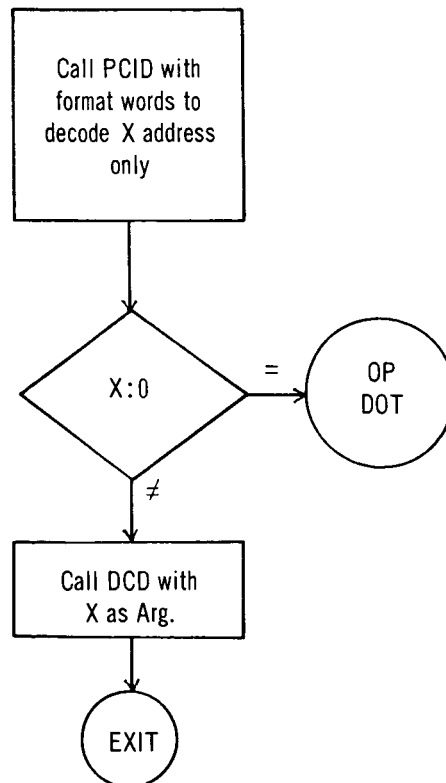
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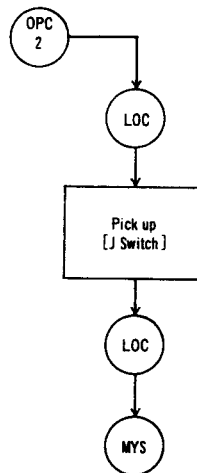
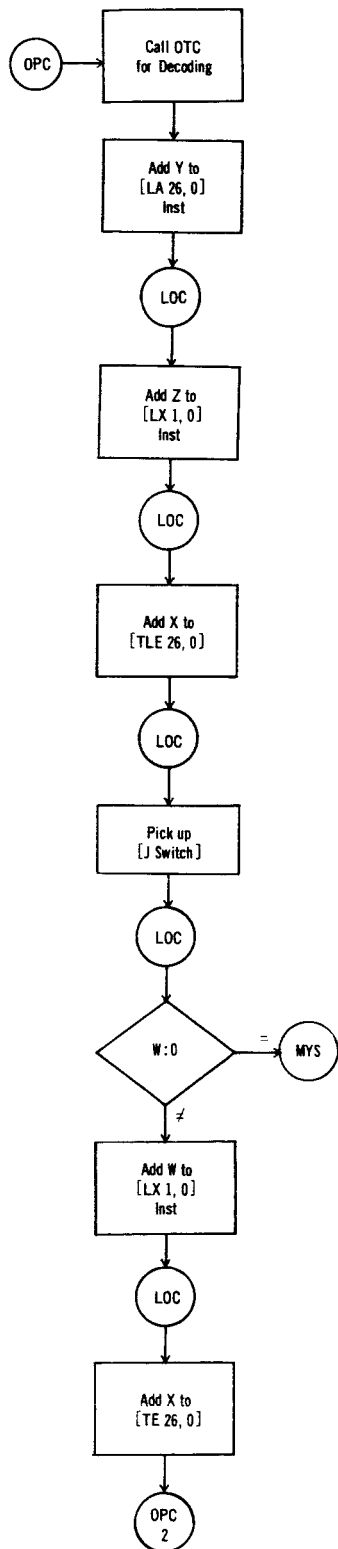
NOTE: Same flow for OPS with [FS 26] in place of [FA 26].



OTB

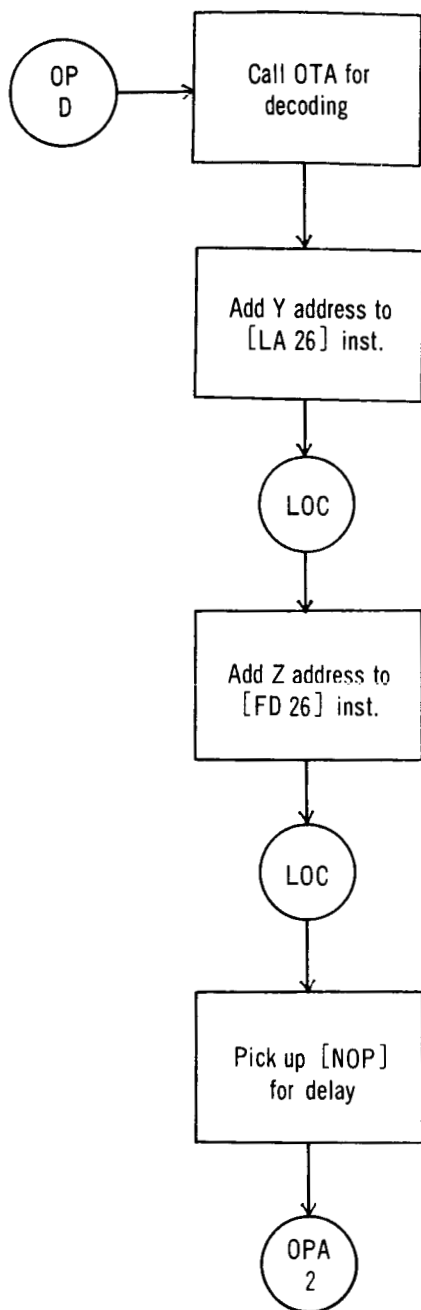


OP C



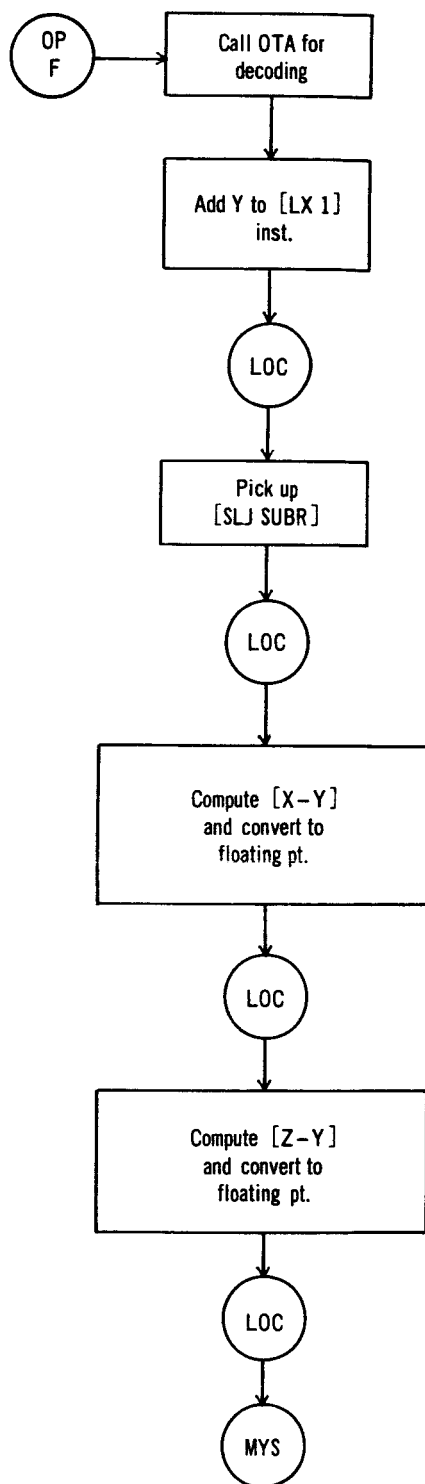
OP D

FD = Floating Divide

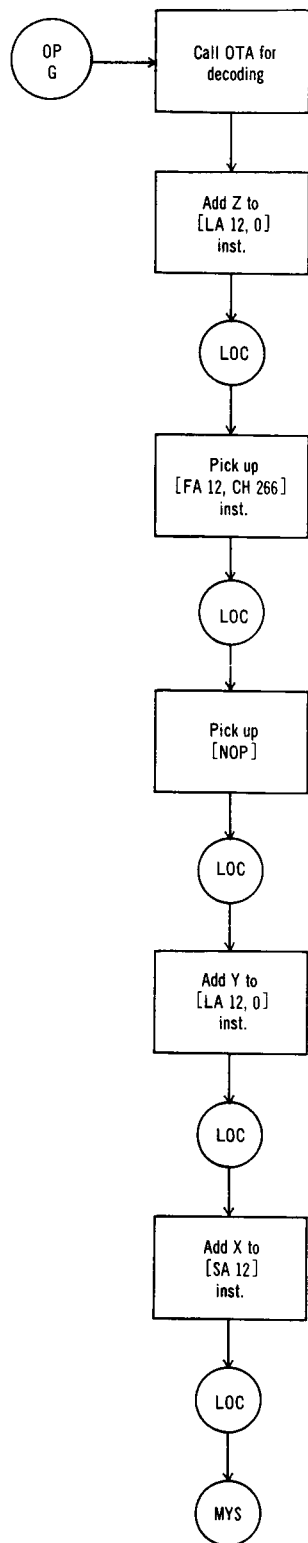


NOTE: Same flow for OPM with [FM 26] in place of [FD 26].

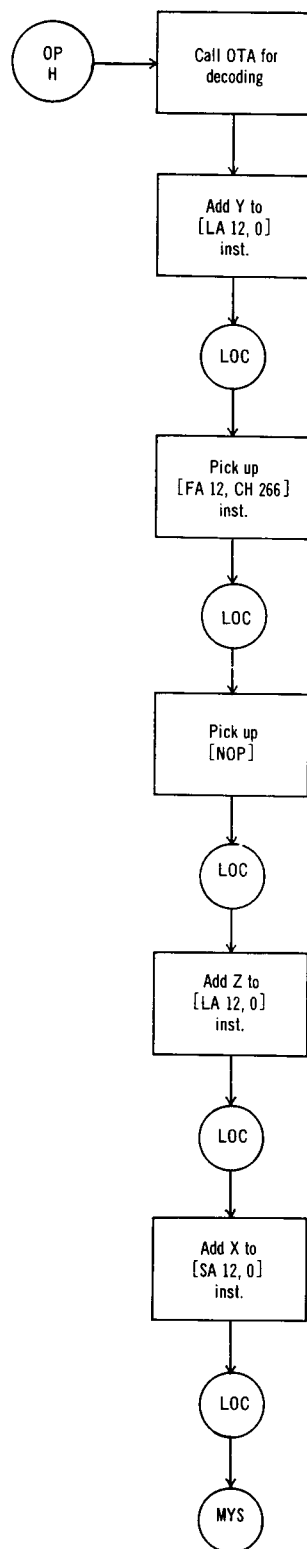
OP F

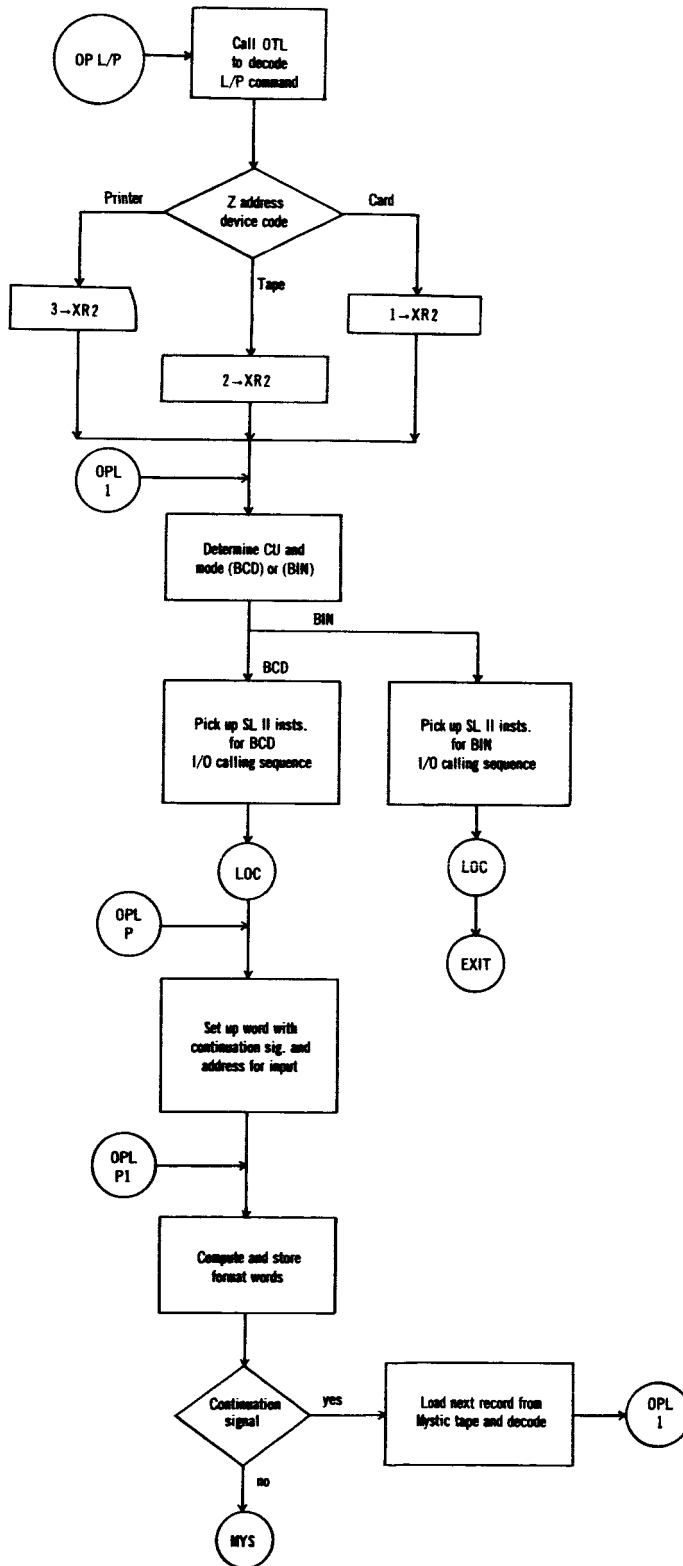


OP G

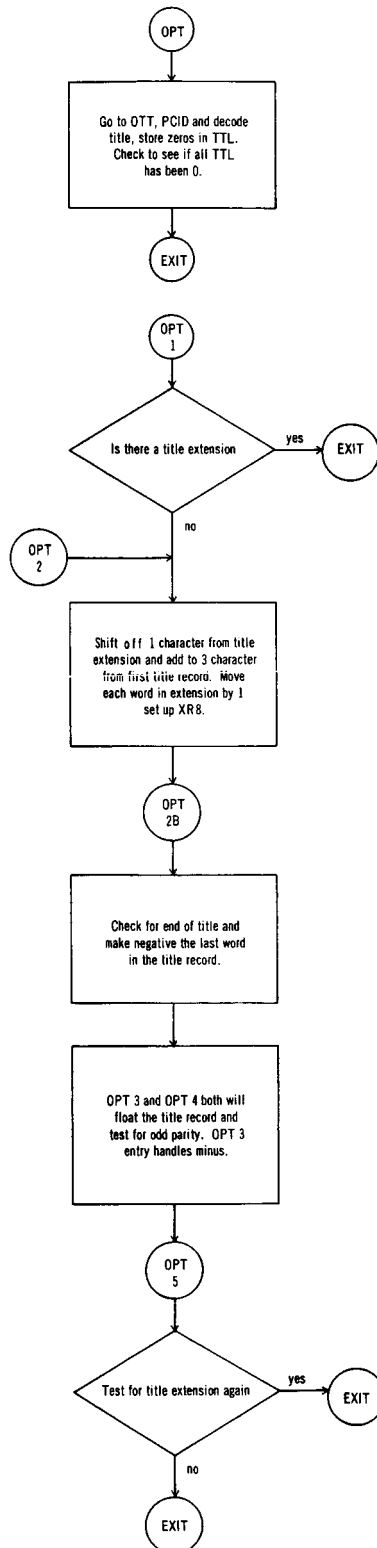


OP H

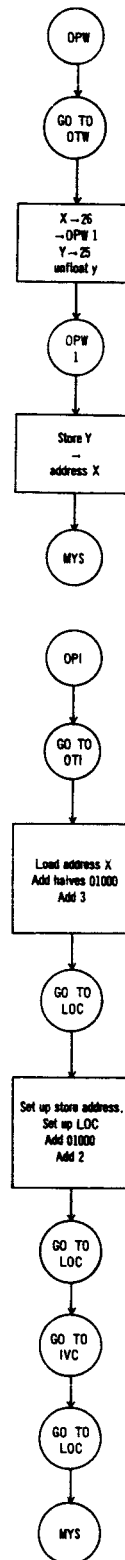
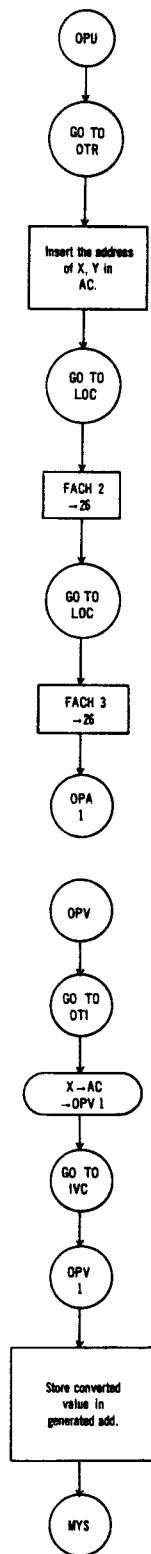




OPT

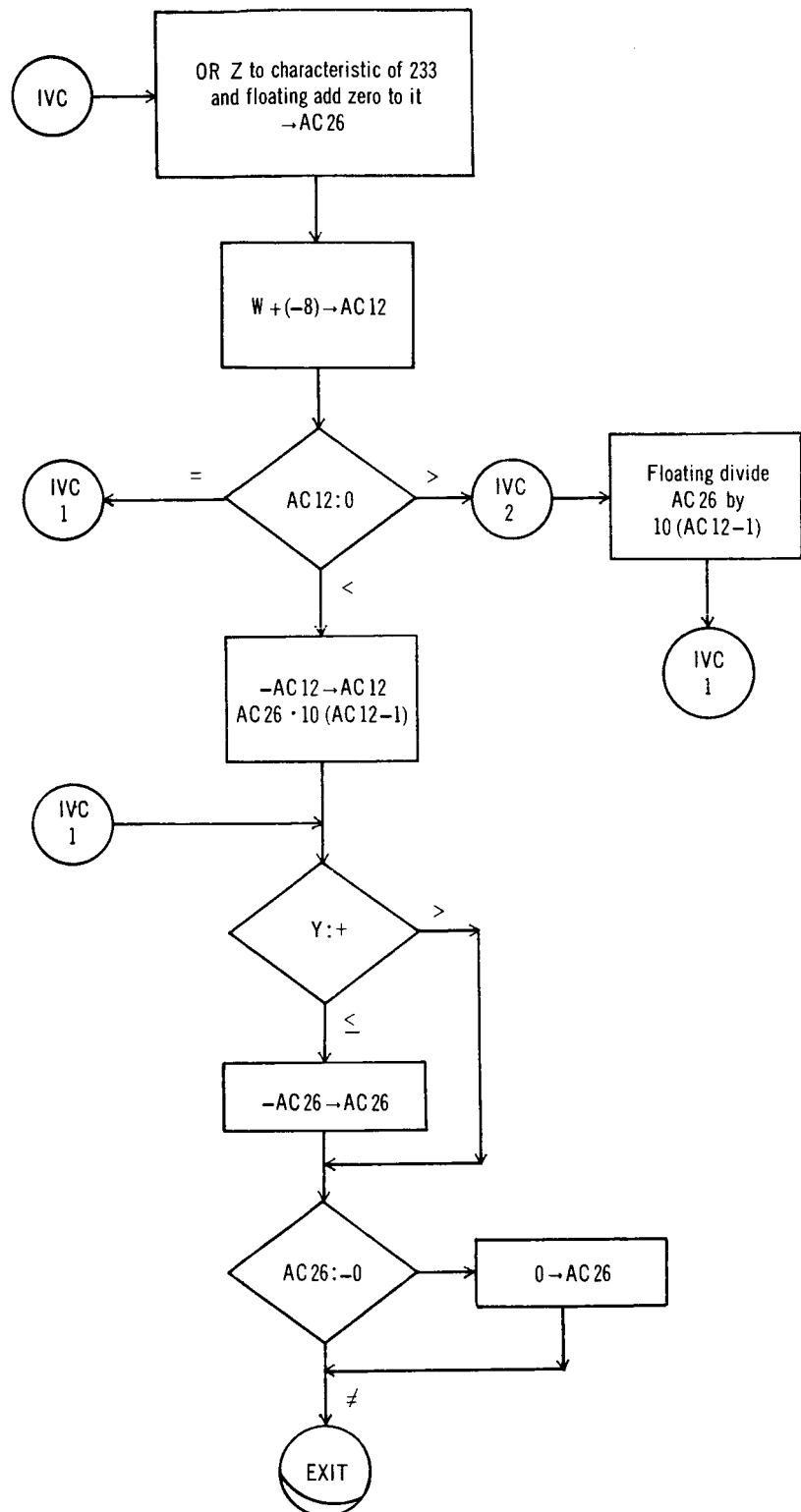


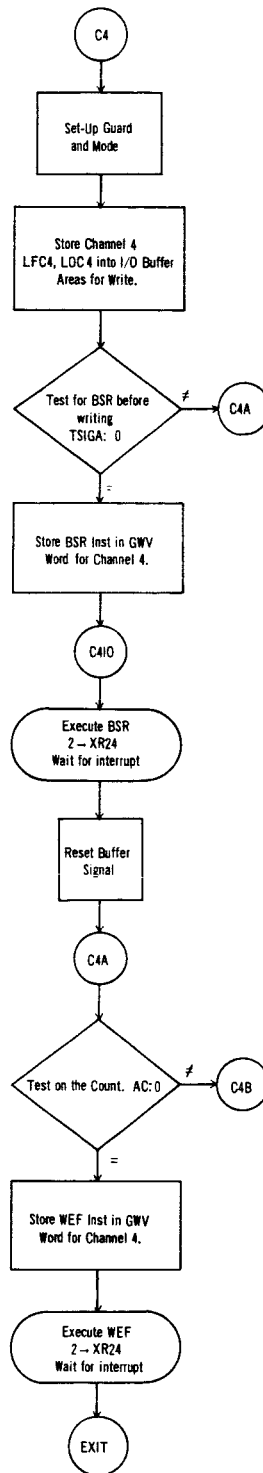
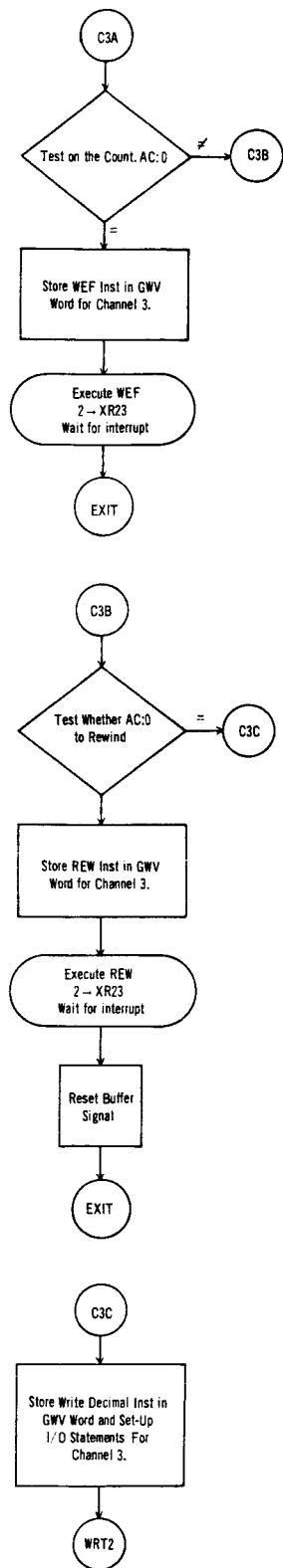
OPI, V, W, I

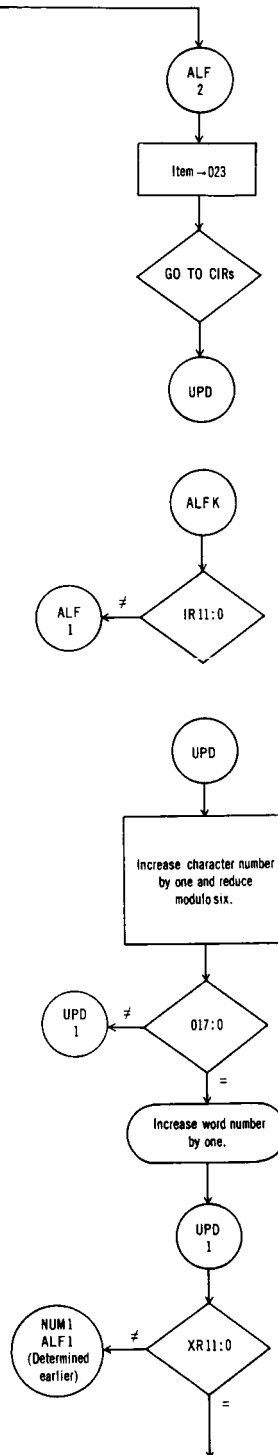
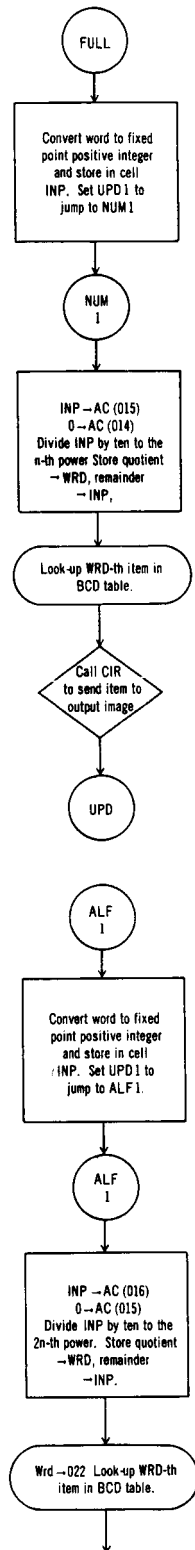


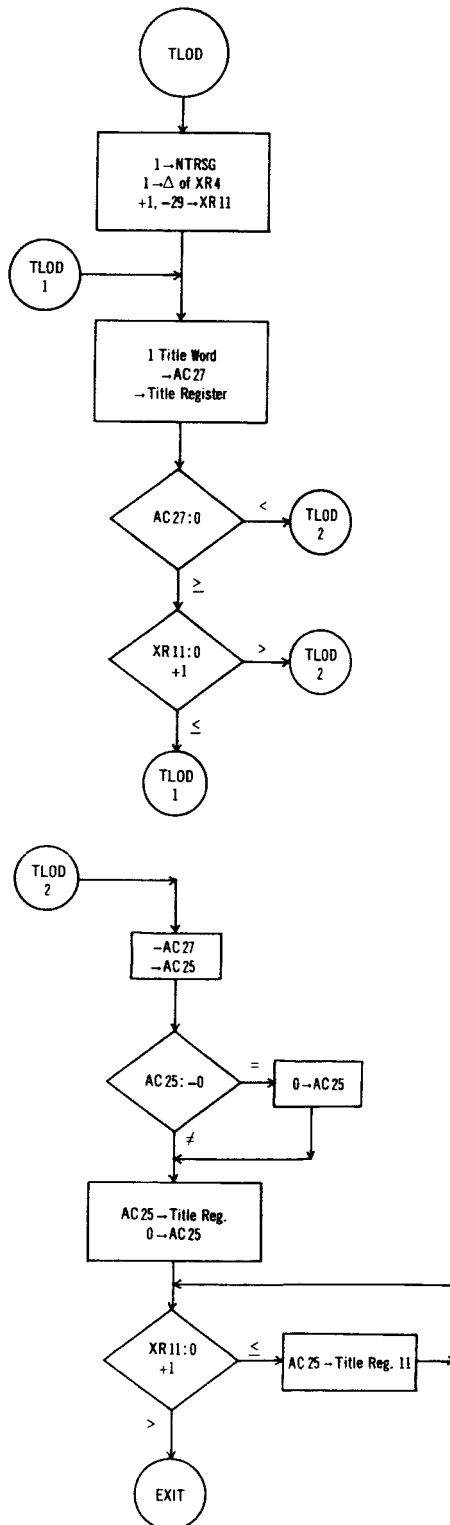
IVC

Initialize-Value
Floating point
Conversion routine

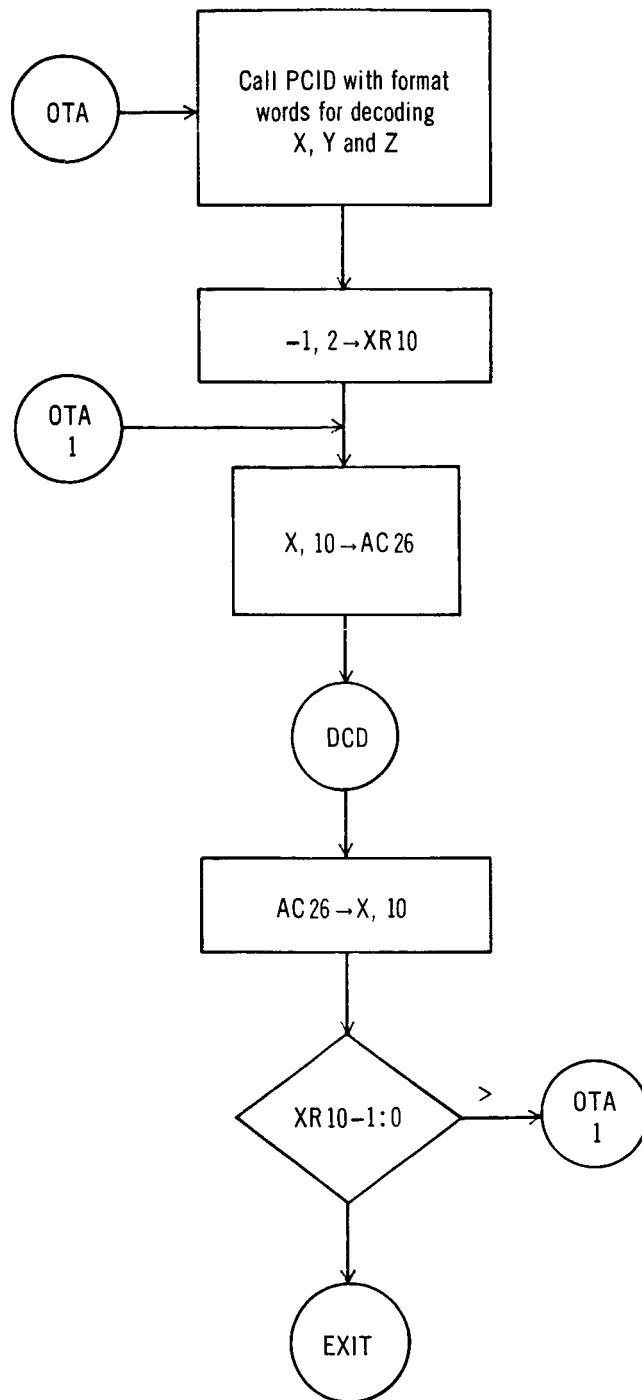




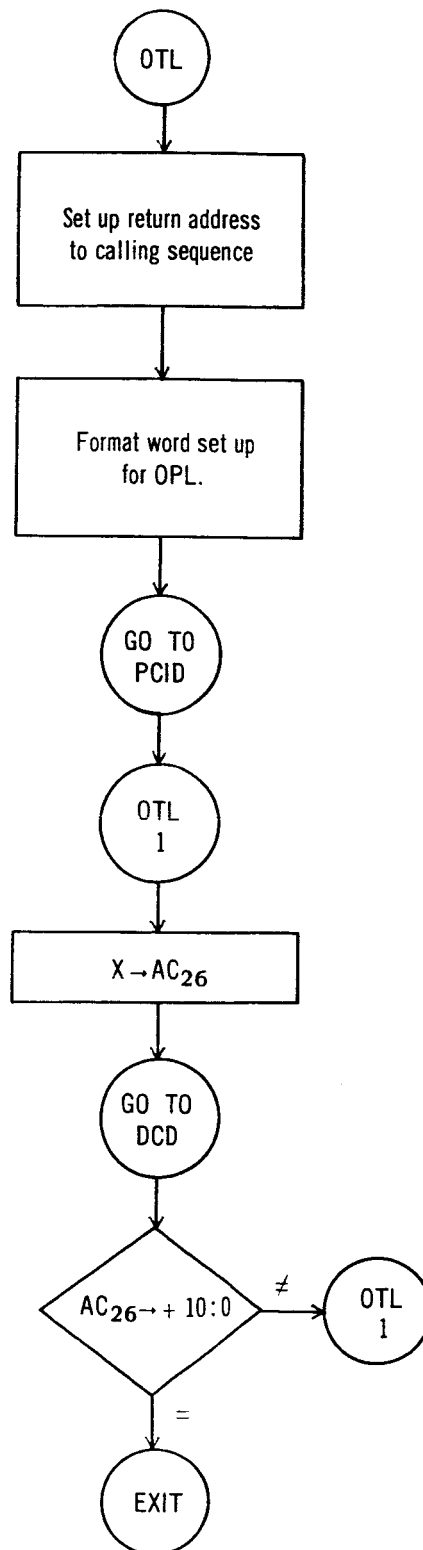




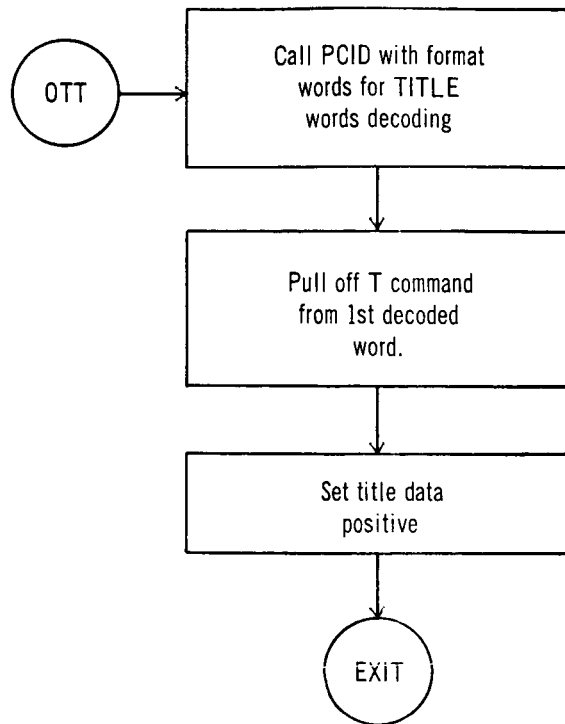
OTA



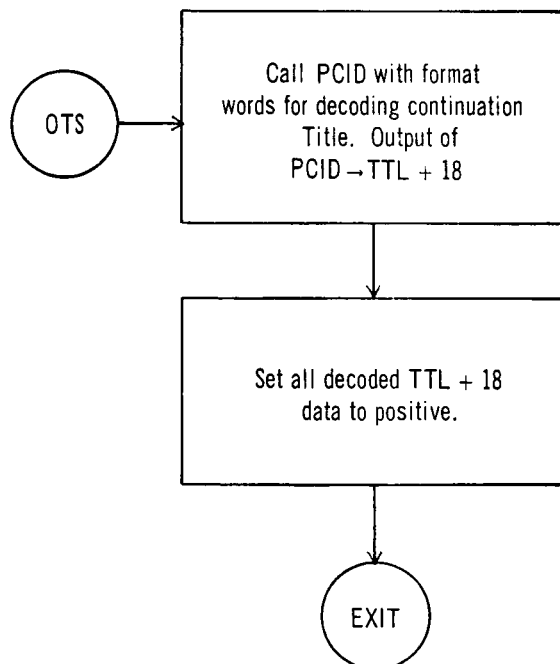
OT L



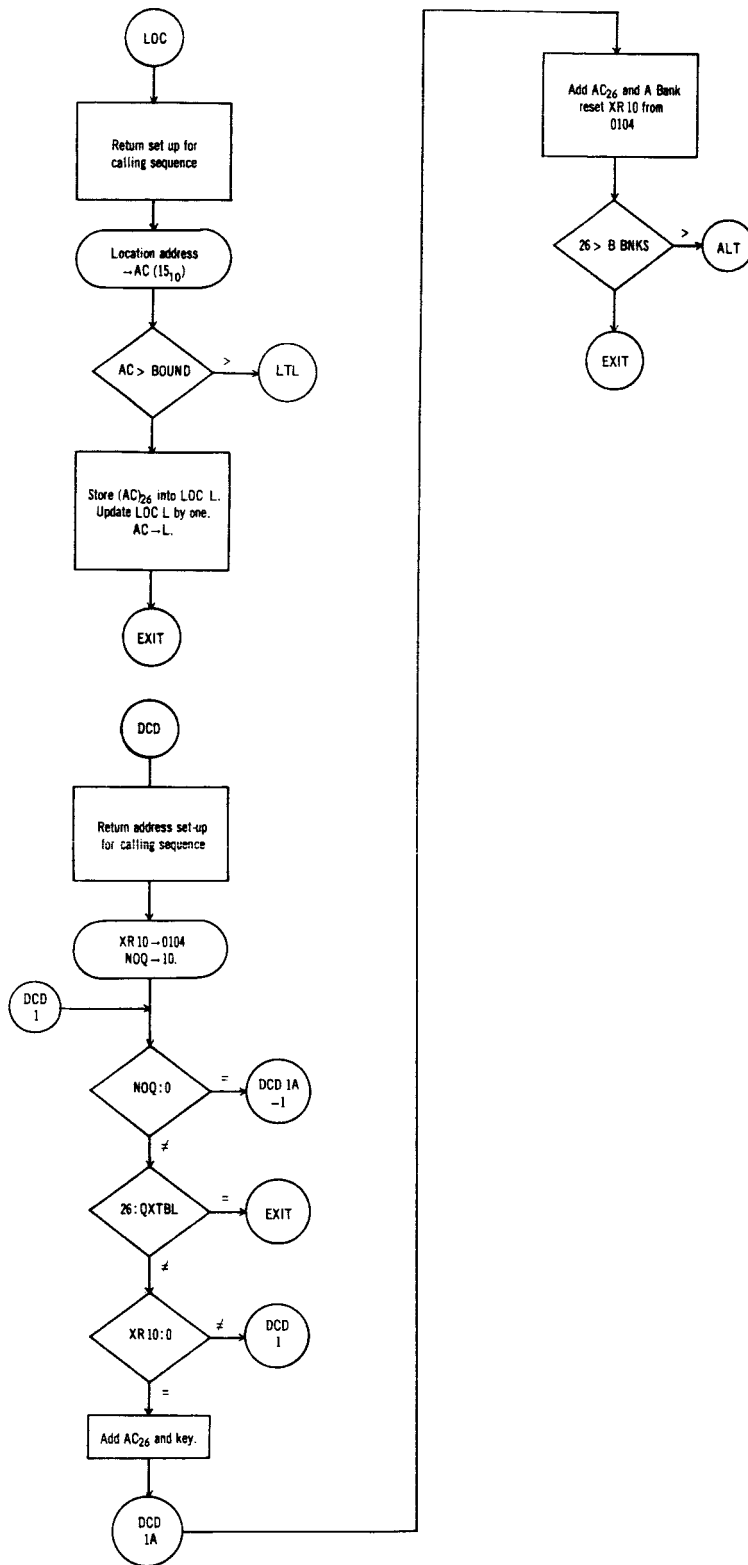
OTT



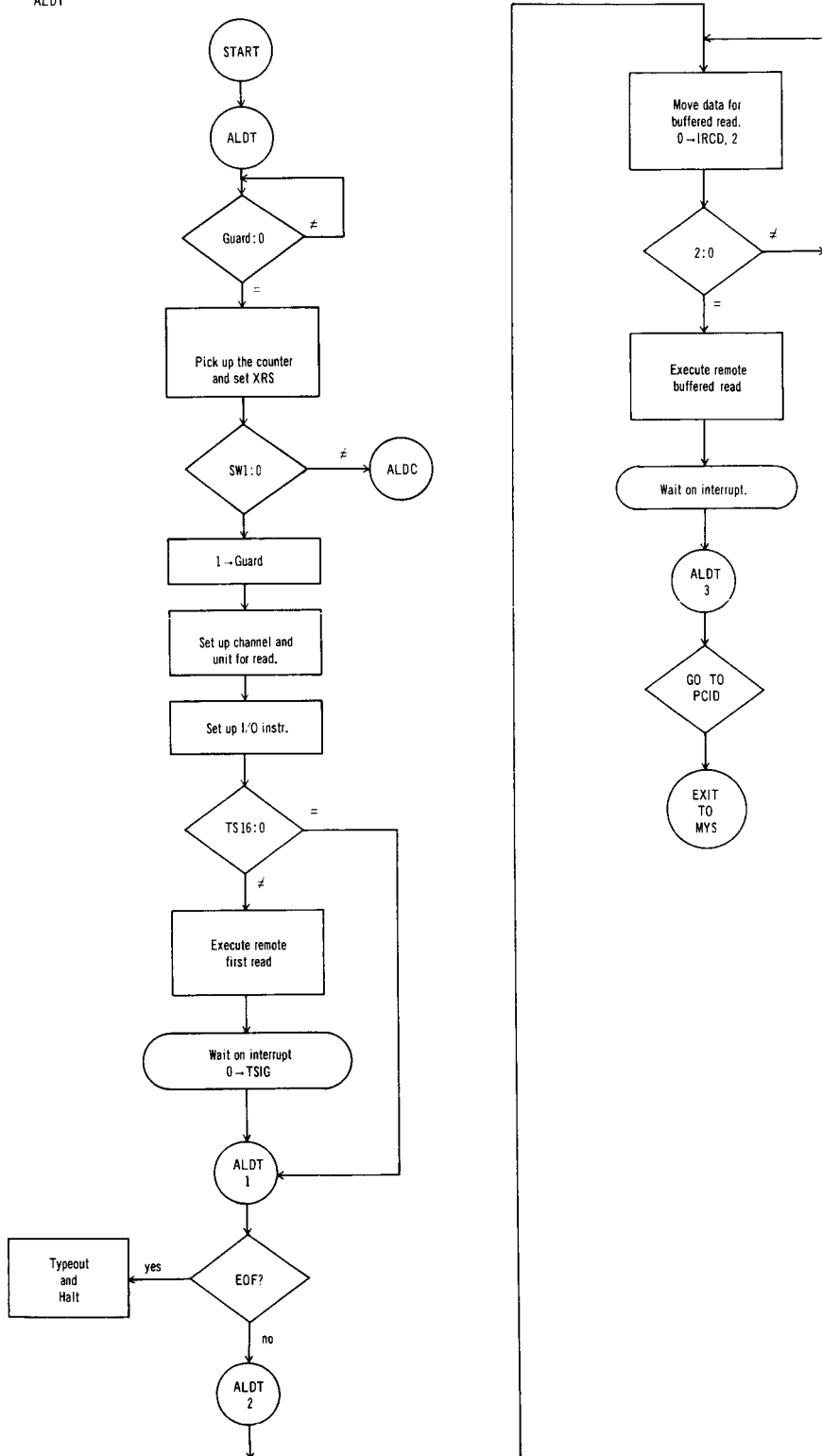
OT Amp

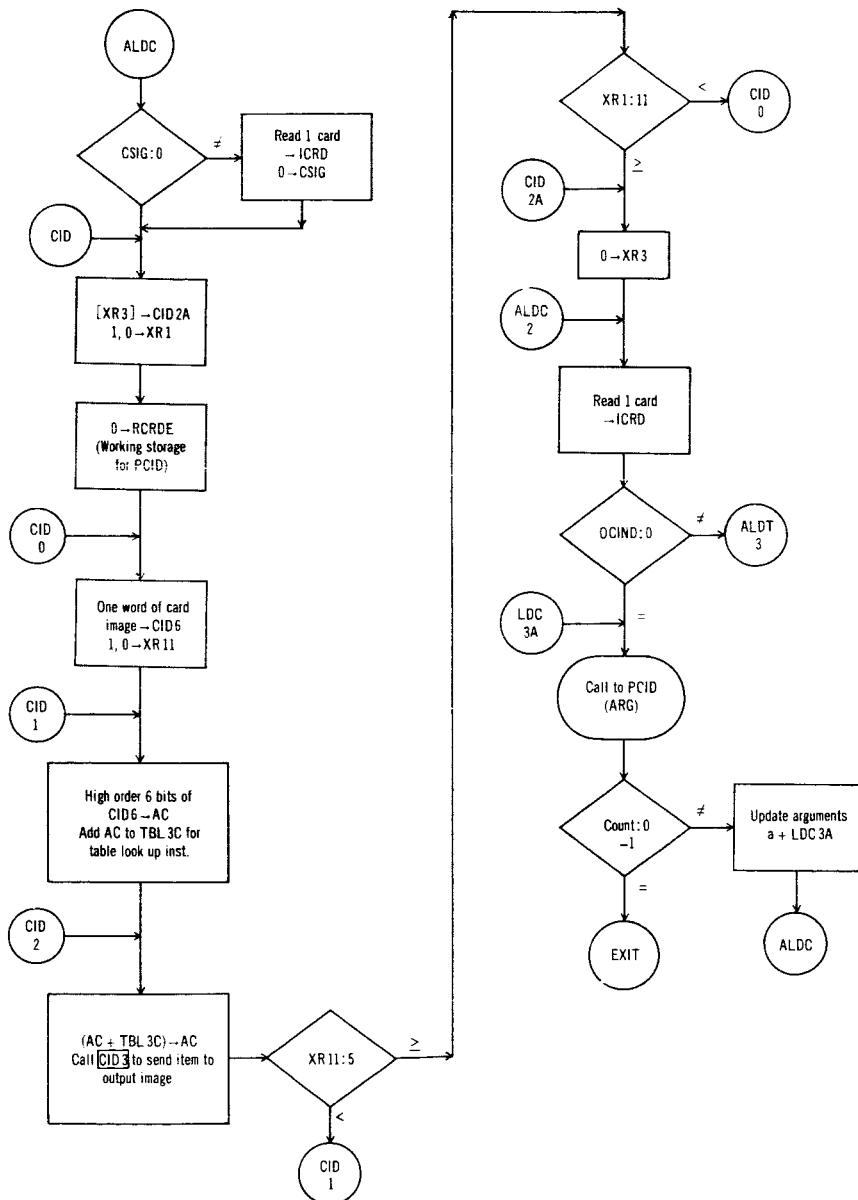
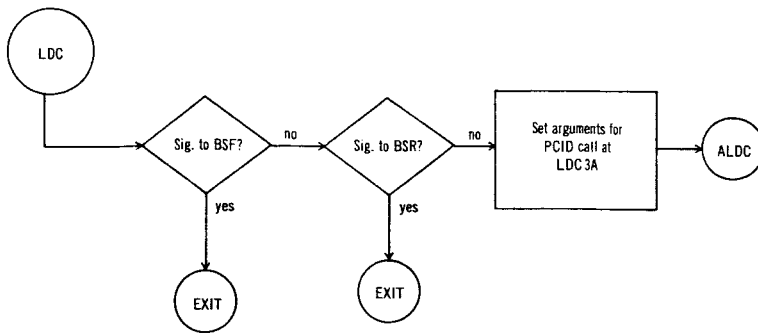


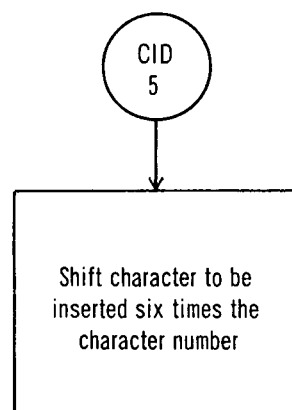
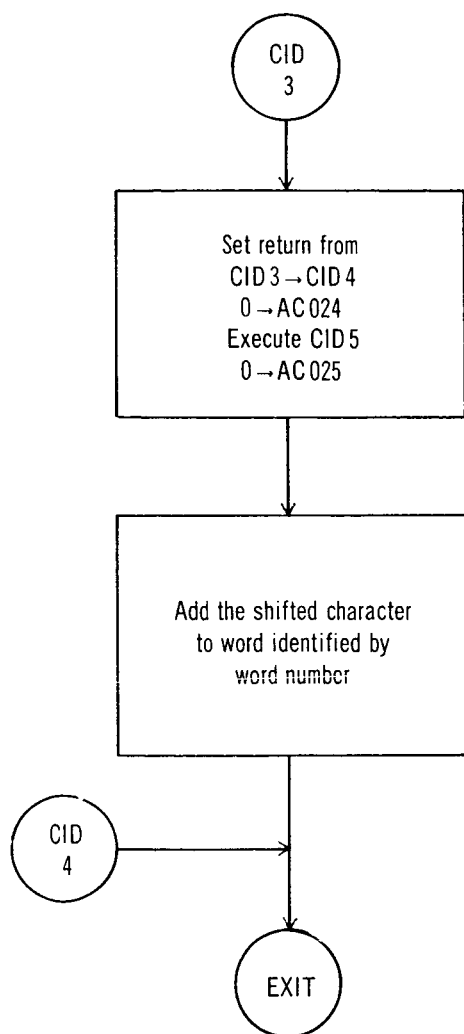
LOC, DCD



ALDT

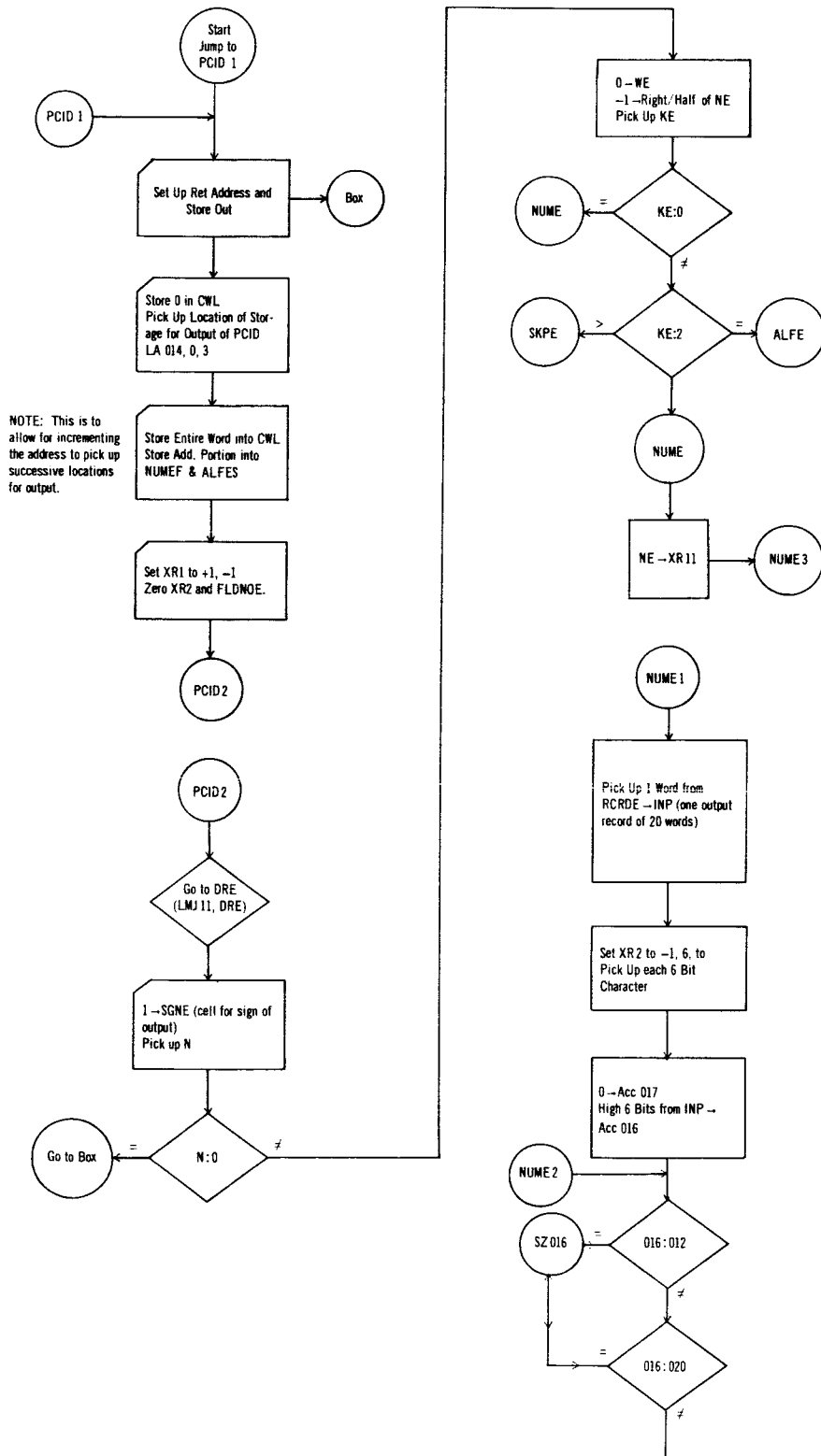


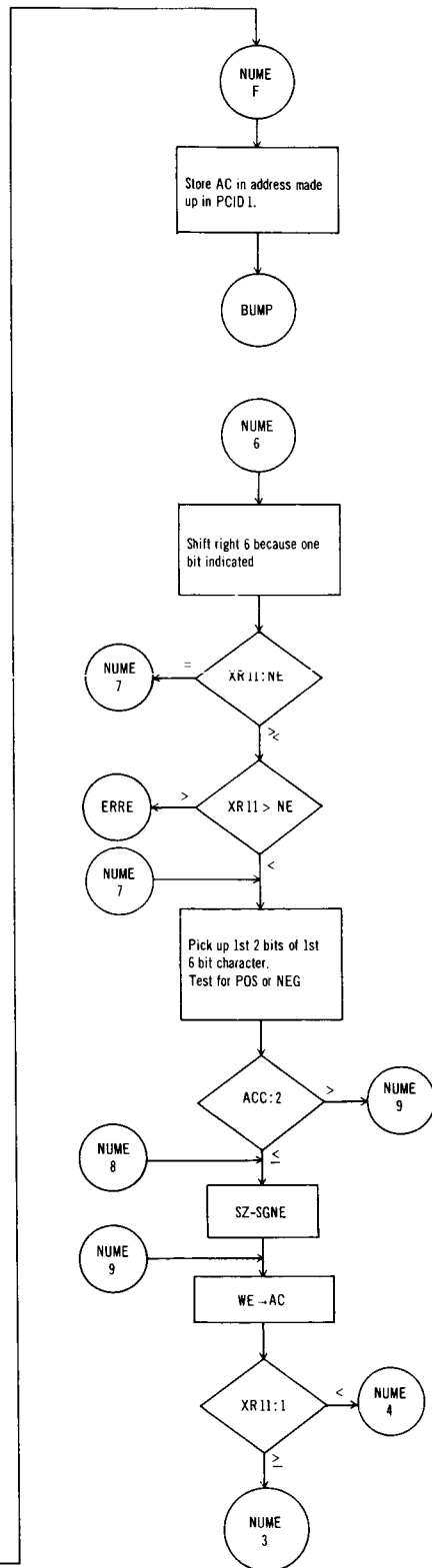
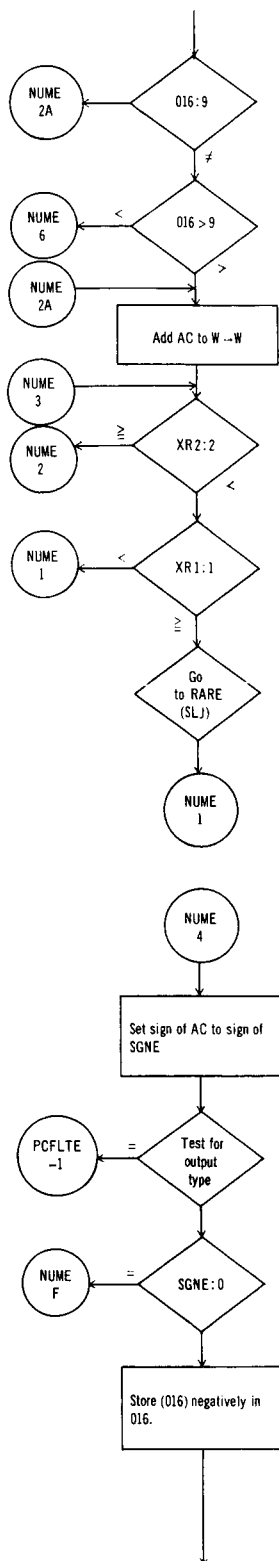


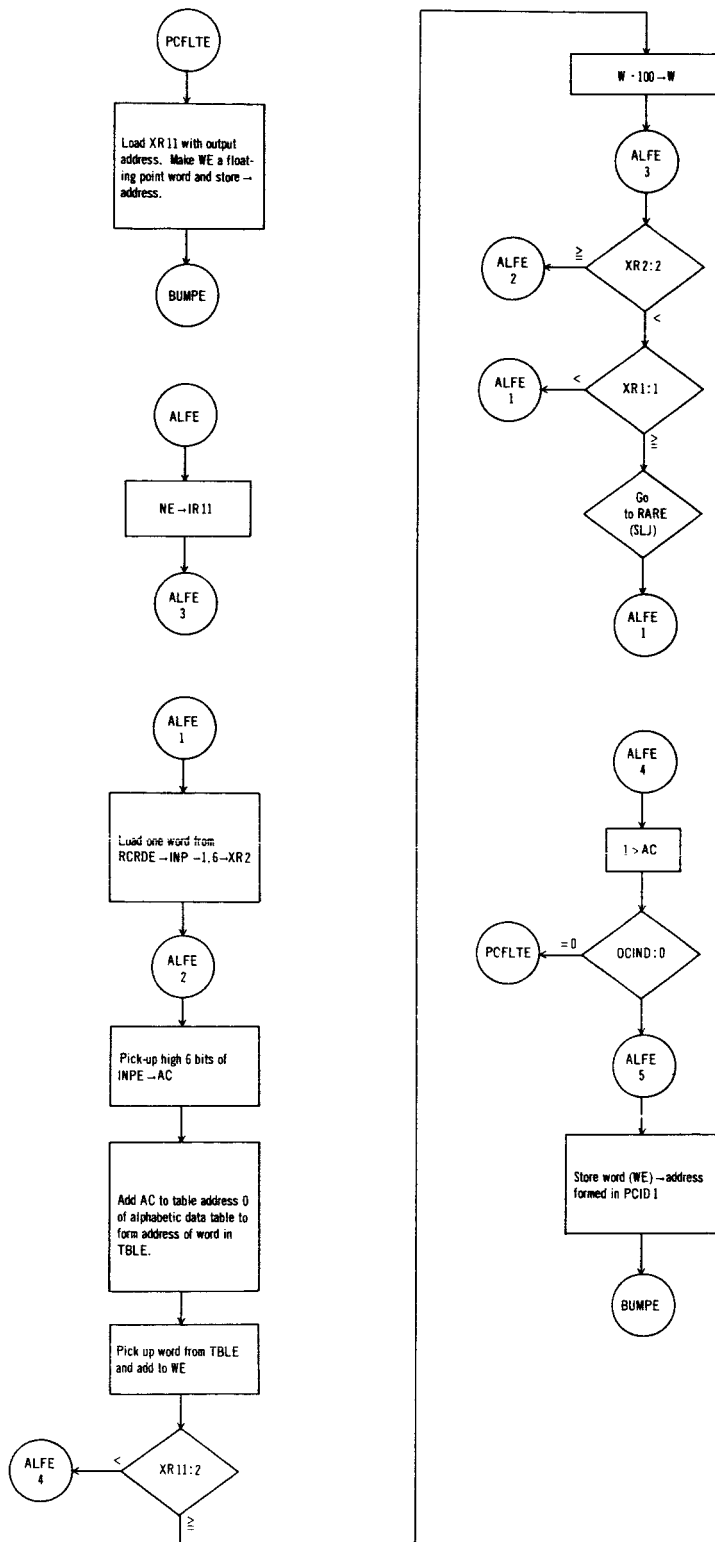


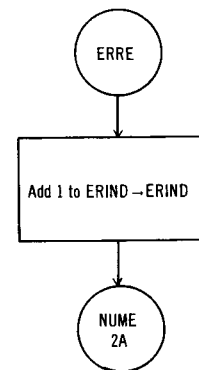
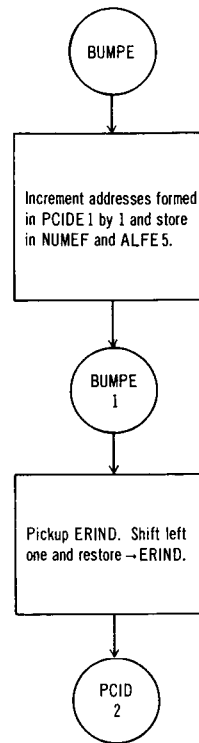
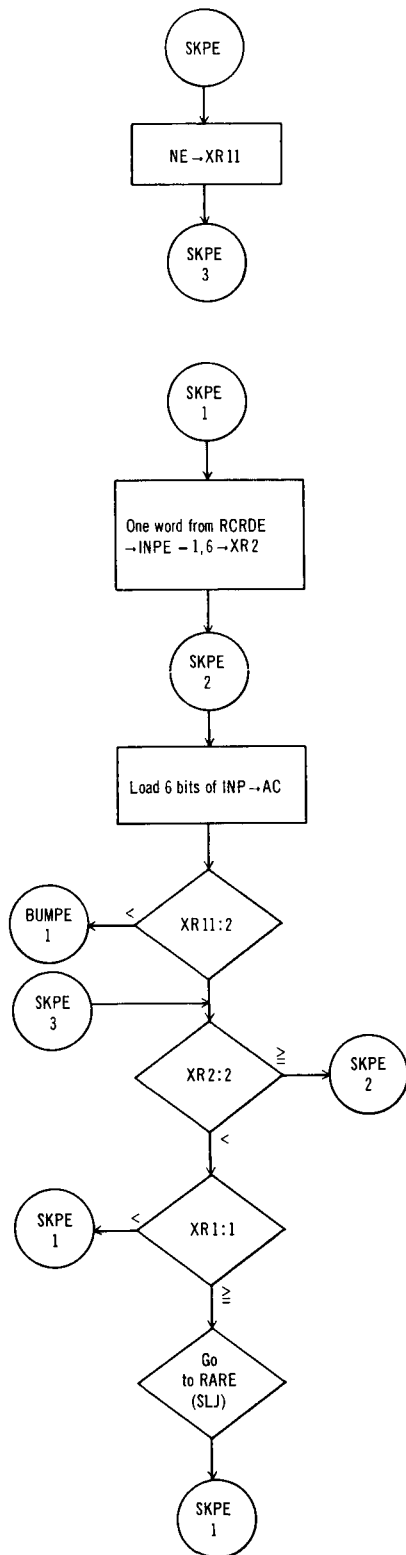
NOTE: OCIND = 1, during compilation
= 0, during execution

PCID - PERIPHERAL CARD IMAGE DECODER.









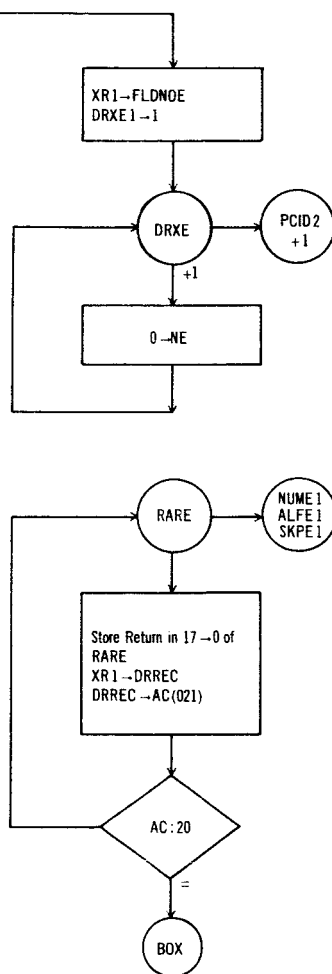
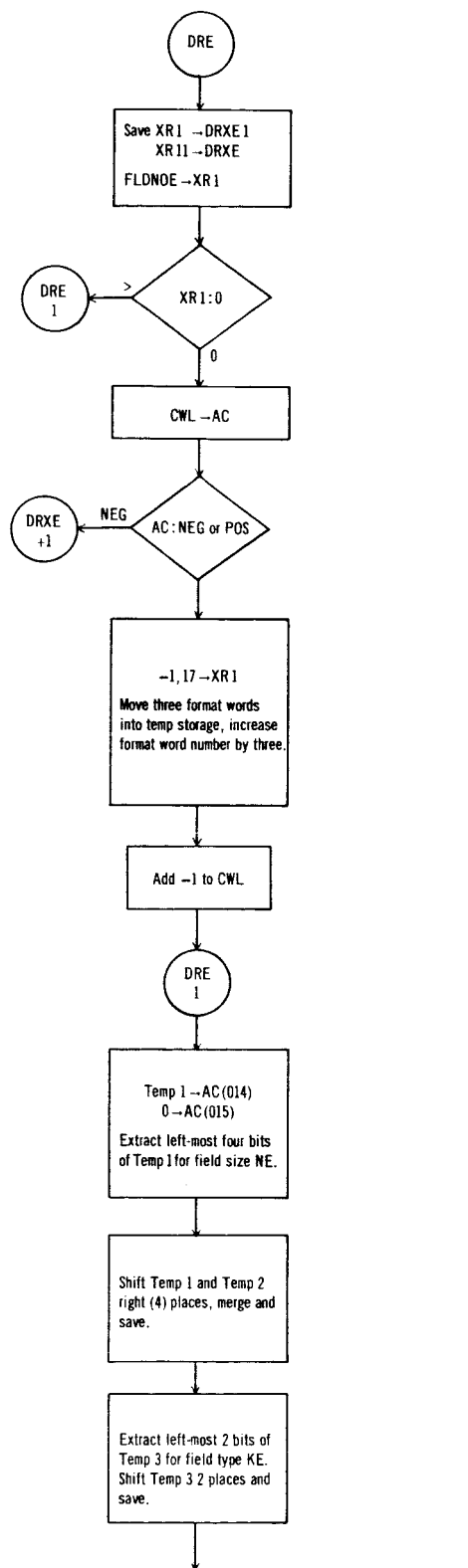


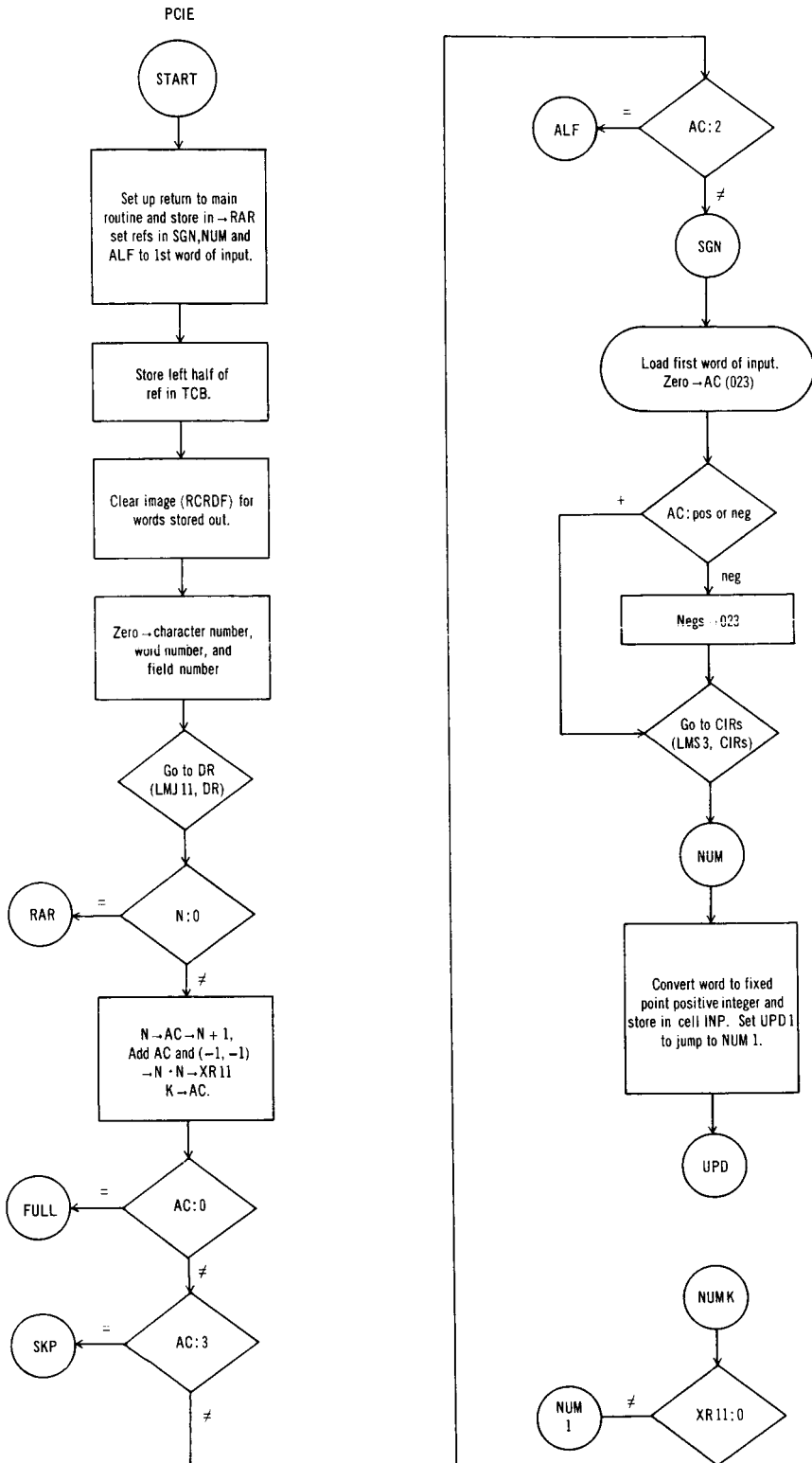
TABLE referred to here is a table of values which are the Mystic Alphabetic codes.

NE = number of columns to process

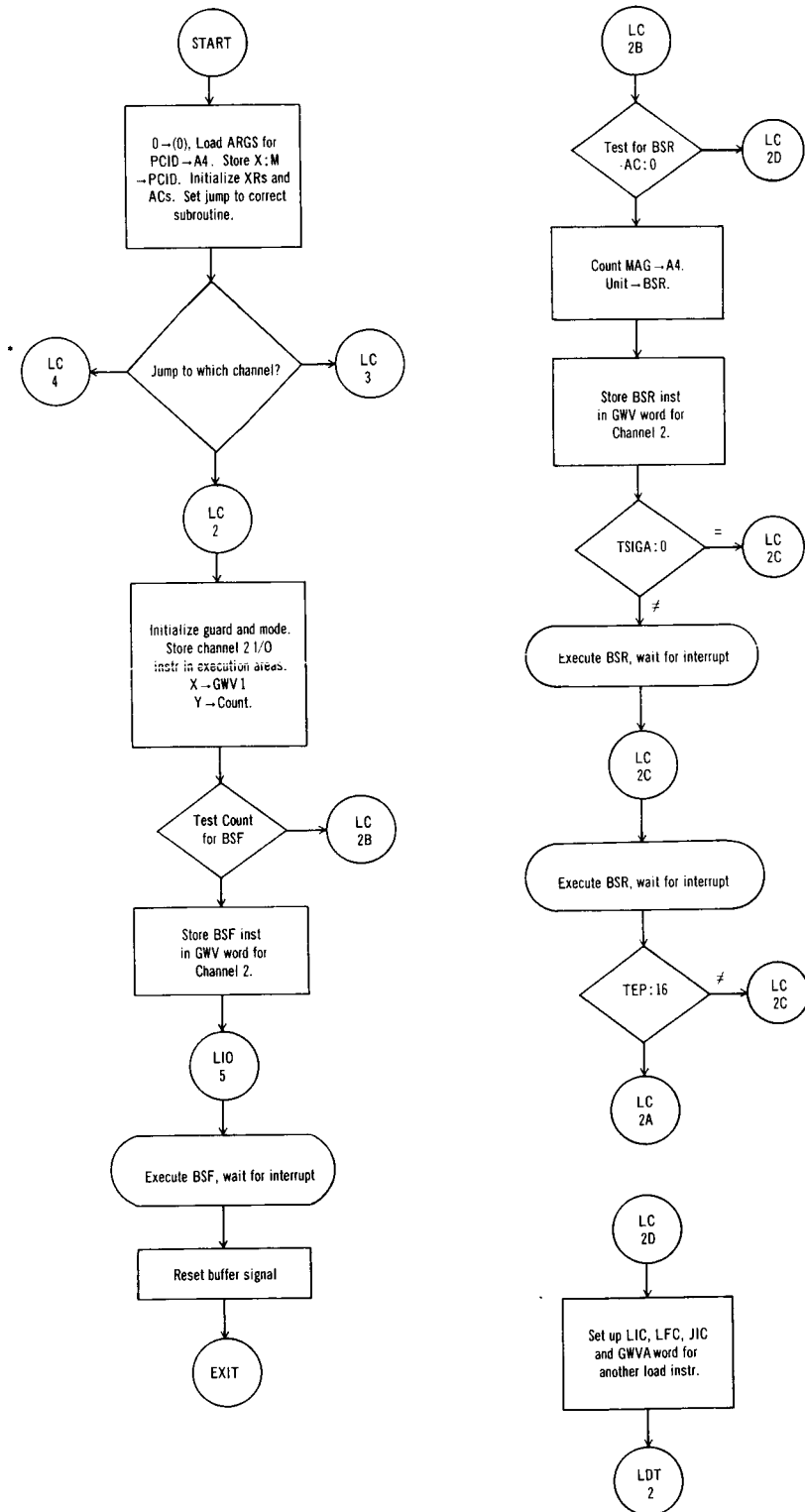
KE = kind of data (A, F, N, S)

WE = accumulator for output data word.

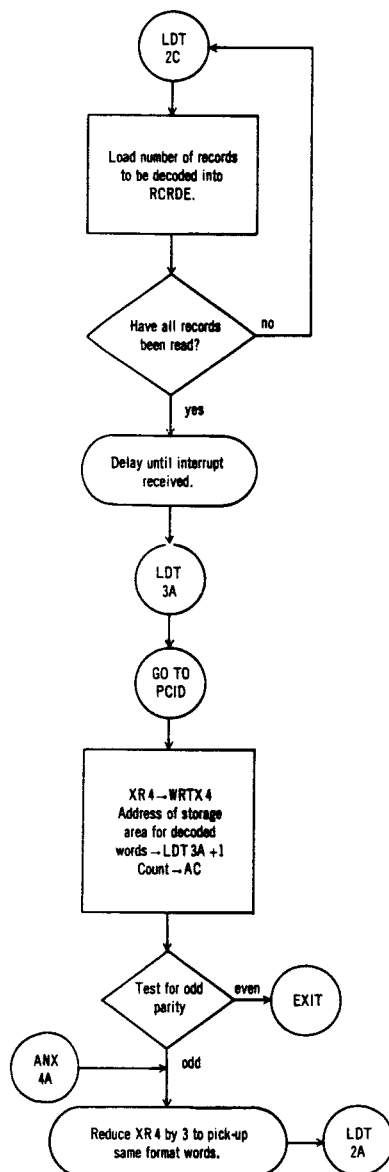
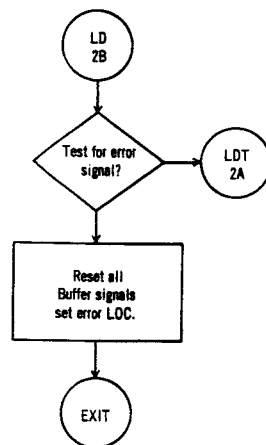
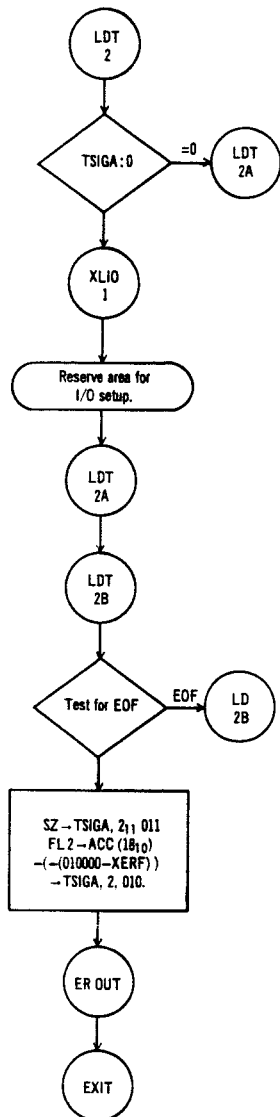
RCRDE is a 20-word table stored by the calling sequence to this routine.

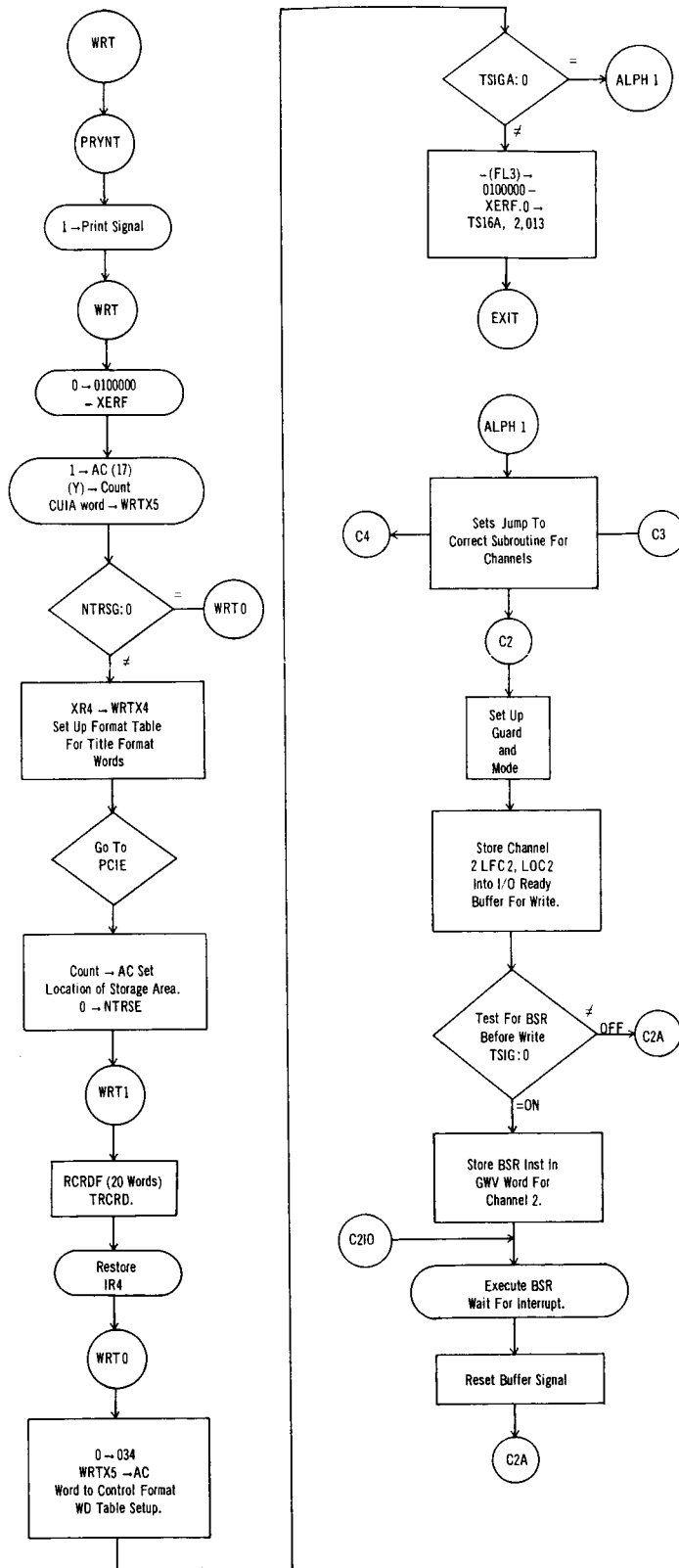


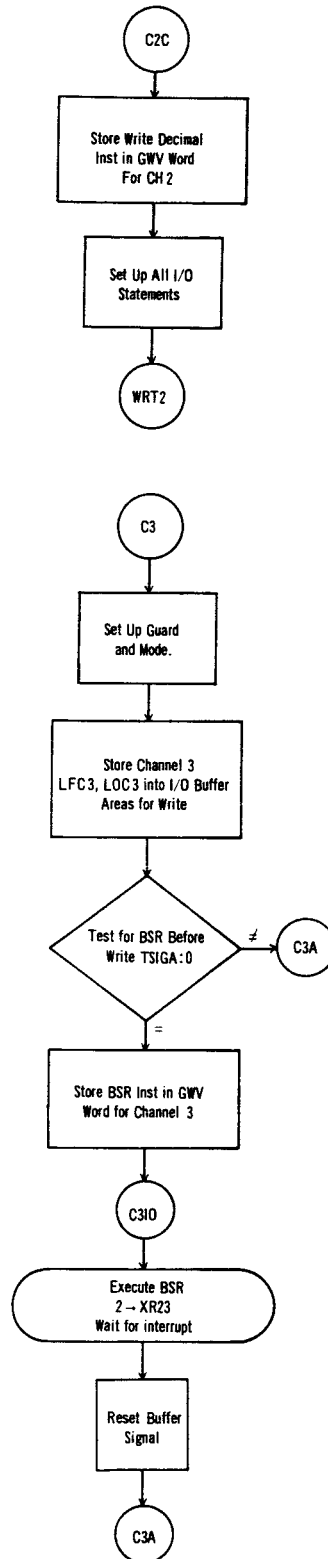
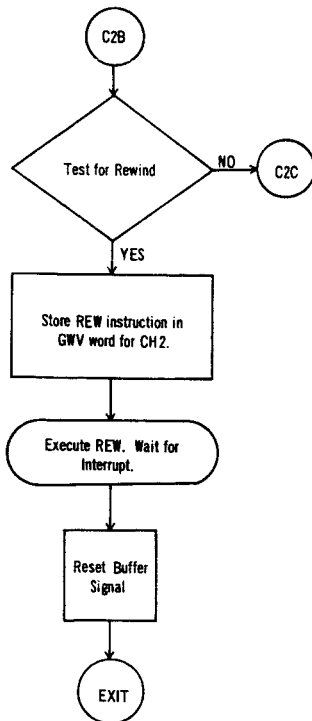
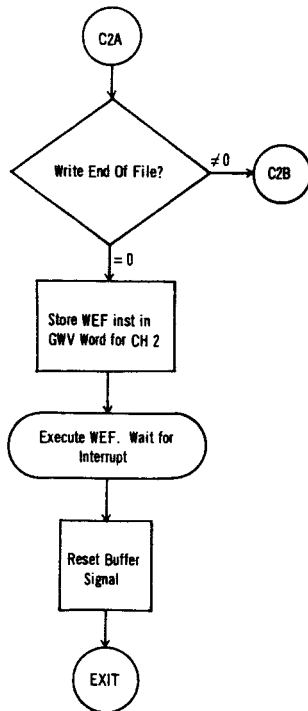


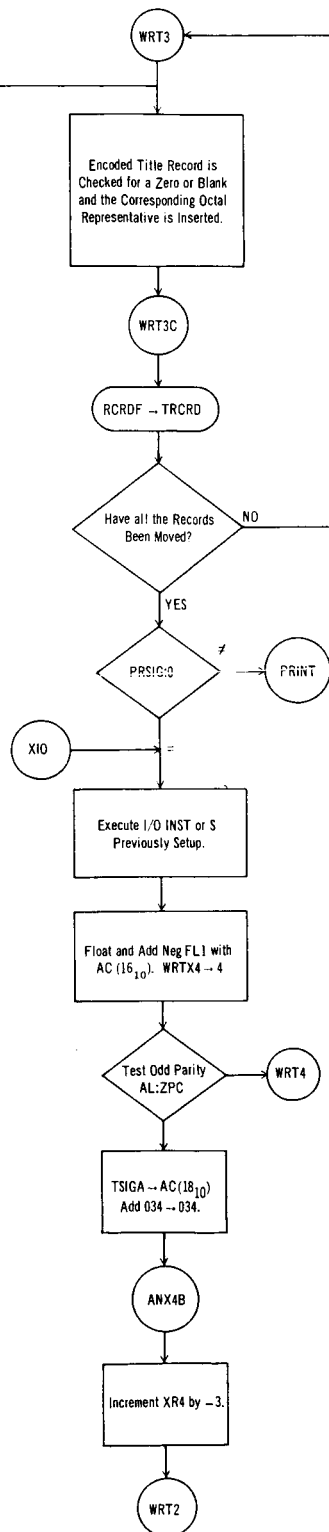
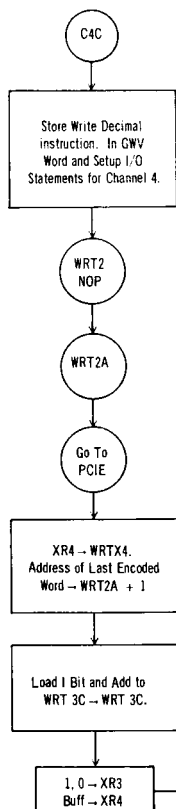
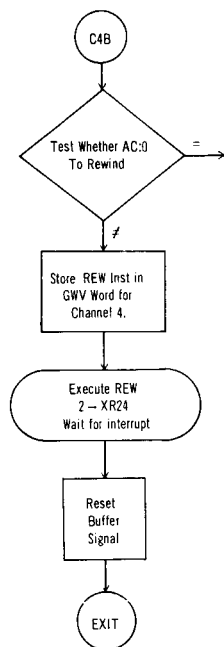


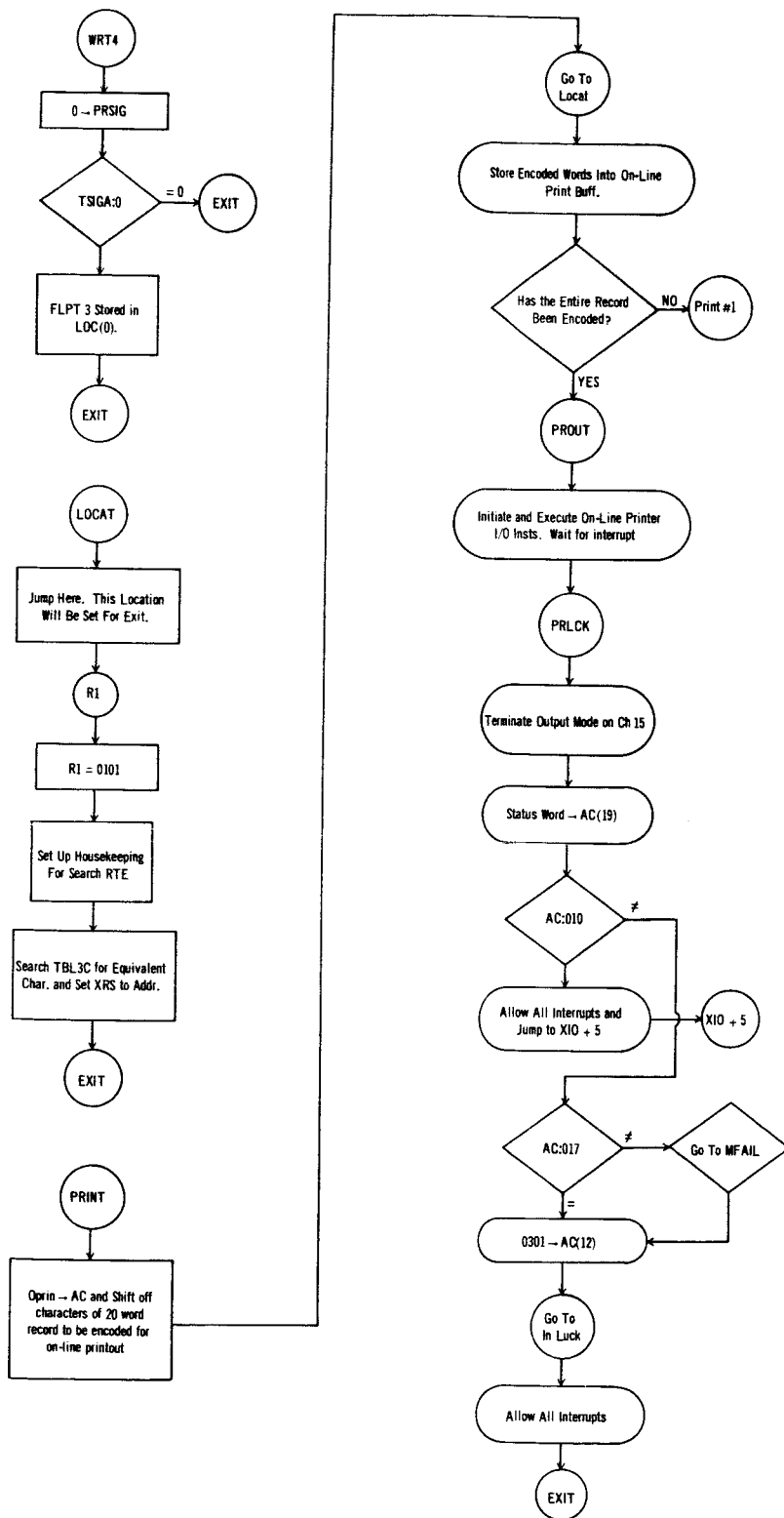
*LC 4 and LC 3 will follow the same line of flow. The difference is in the Channel Selected.

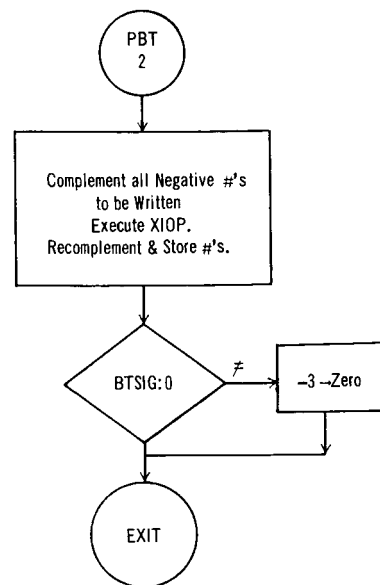
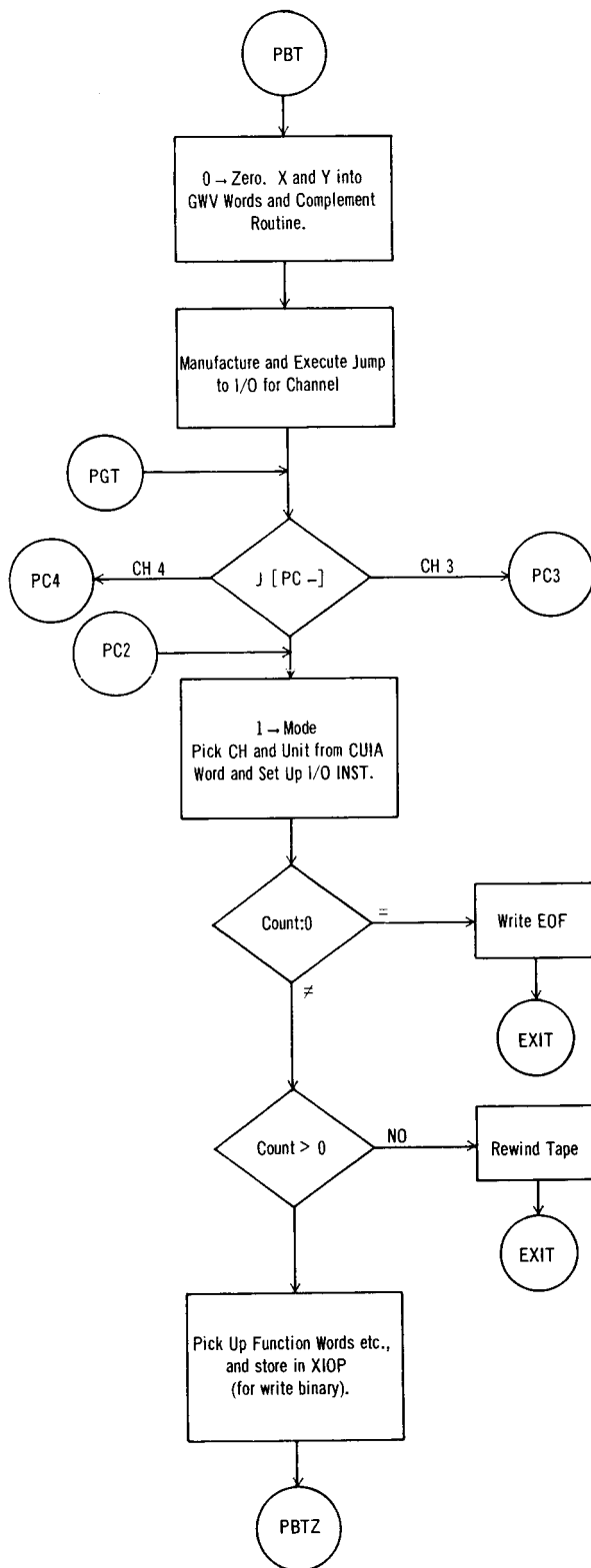






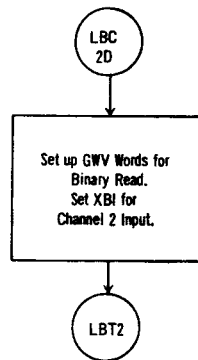
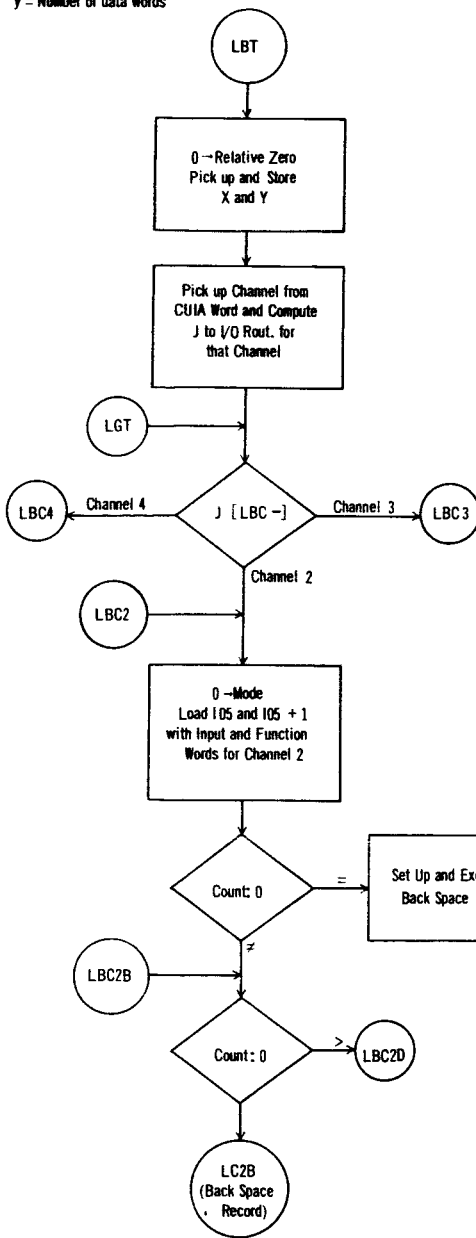




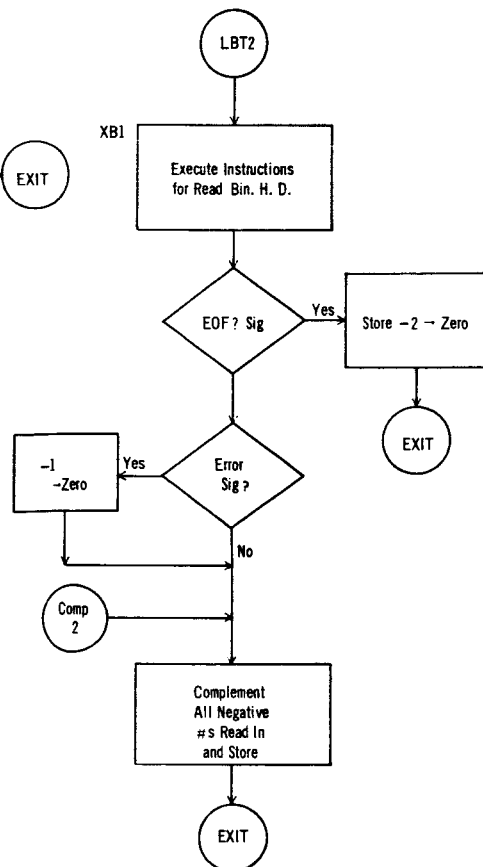


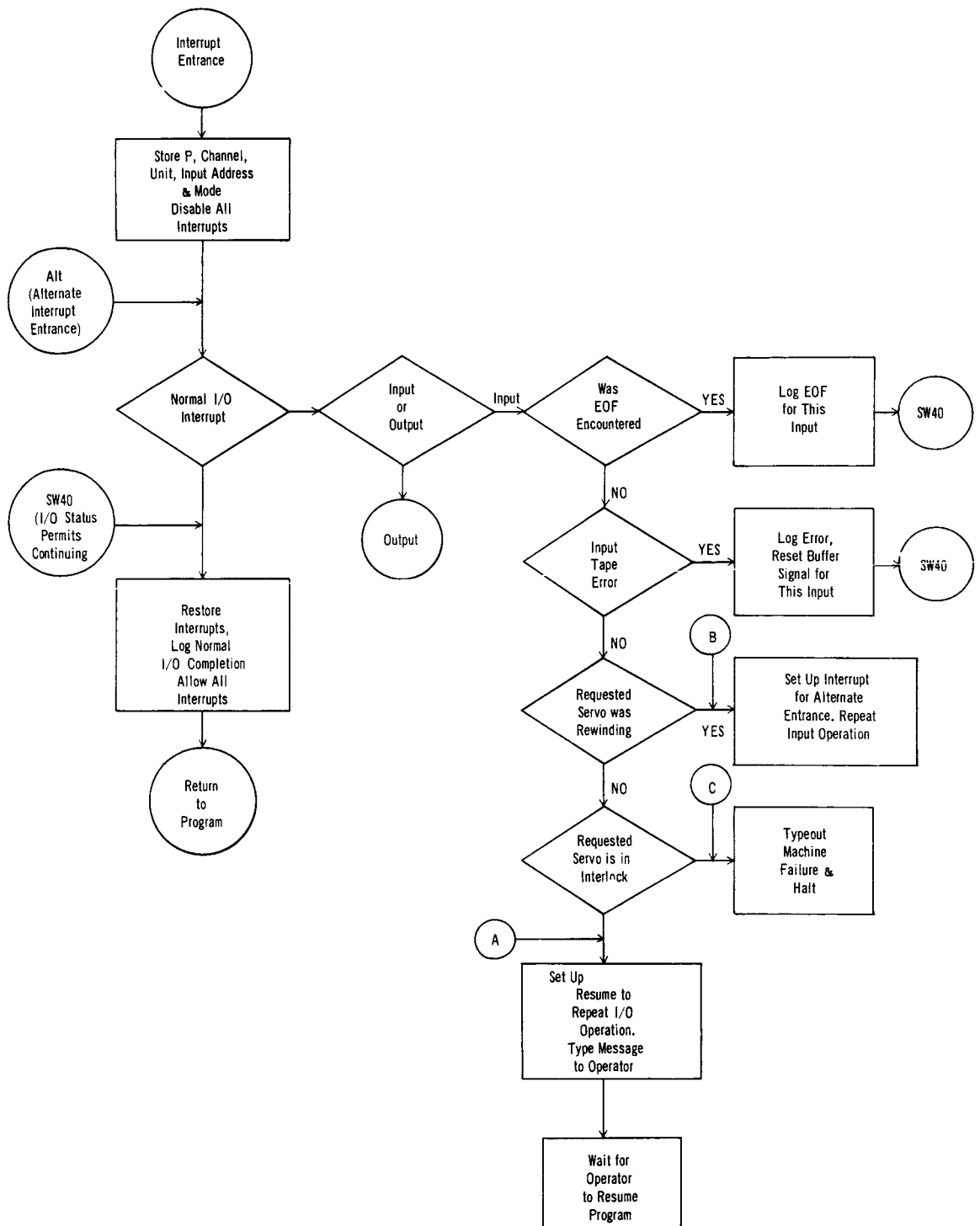
NOTE: PC4 & PC3 are identical to PC2 except for necessary differences in Channel references.

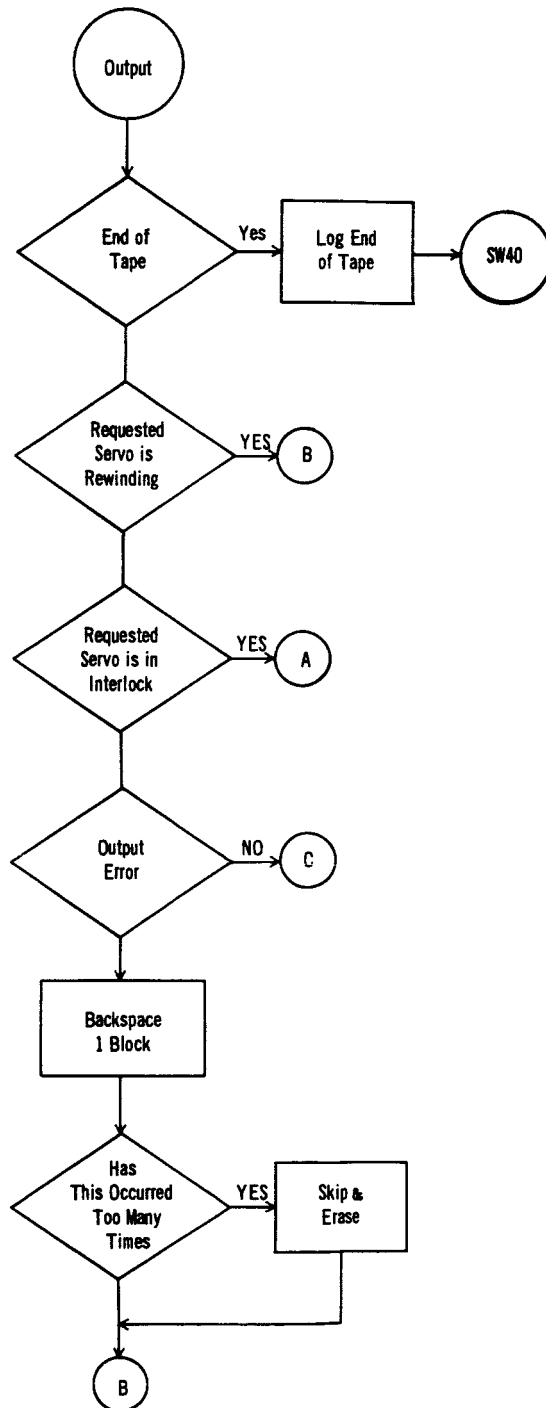
x = Location of data words
y = Number of data words



NOTE: LB3 and LB4 are identical to LB2 except where channel references are necessary.







CAMEO FOR UNIVAC 1107
SLEUTH II LISTING

CAMEO FOR UNIVAC 1107

SLEUTH II LISTING

```

$(1),MYSTIC HJ      $+1
BOOT      AACI
          AAIJ      STALL
E          EQU      0
BOOTB     LL        0170360
          AACI
          LX        1,BBCCM-E
          JK        11,$+4
          NDP
          SZ        SYSCD+1-E,1
          JMGI      1,$-2
          LA        19,SYSCD-E
          JP        19,LDSYS-E
          LA        12,GWCMF,,016
          LA        13,GWVLD,,016
          LMJ       2,BIO1
          LA        19,CRD6
          LA        20,01,,017
          JK        15,$+3-E
          LA        19,CRD2
          LA        20,0,,017
          SA        19,CRDT
          SA        20,SW1
          LA        19,INTWA
          SA        19,I2-E
          J         CLEAR
RDIO      LA        19,INTWD
          SA        19,I2-E
          LA        19,1,,016
          SA        19,CSIG
          SZ        OCIND
          JK        13,$+3
          LX        1,OP
          J         SWCH
          LFC       2,GA2RW-E
          LX        1,OP
          J         SWCH
LDSYS     LMJ       2,SYNO
          LA        12,GWSYS,,016
          LA        13,GWVLD,,016
          LMJ       2,BIO1
          TE        19,SYSCD-E
          J         LDSYS+1-E
SETUP     LA        19,INTWD
          SA        19,I2-E
          LX        1,XSW
          J         SWCH
WRTA3     SLJ       PAUSE
          LA        19,ONE
          SX        1,XSW
          SA        19,IOOR
          LA        19,JBT1
          SA        19,130
          SZ        SYSCD-E
          LA        12,A3GWV,,016
          LA        13,GWSBT,,016
          LMJ       2,BIO3

```

LOADING SYSTEM OR COMPILER

CARD OR TAPE INPUT

	LMJ	2,SYSNO
	LA	12,A3GWV,,016
	LA	13,GWSYS,,016
	LMJ	2,BIO3
	HJ	SETUP-E
SYSNO	SZ	19
	LA	20,040,,017
	JK	6,\$+2-E
	AA	19,20
	SSL	20,1
	JK	5,\$+2-E
	AA	19,20
	SSL	20,1
	JK	4,\$+2-E
	AA	19,20
	SSL	20,1
	JK	3,\$+2-E
	AA	19,20
	SSL	20,1
	JK	2,\$+2-E
	AA	19,20
	SSL	20,1
	JK	1,\$+2-E
	AA	19,20
	SA	19,SYSCJ-E
	J	0,2
BOOTI	DIC	2
	DOC	2
	LA	21,201,,015
	SSL	21,2
	TNE	21,010,,016
	J	BSWOK
	TNE	21,017,,016
	J	DELAY
	LA	21,1,,016
	TZ	IOOR
	LA	21,4,,016
	SA	21,8SPB+,01
	LA	21,BJINT
	SA	21,0202
	AAIJ	\$+1
	LFC	2,GWVBS
	W	
INT	LA	21,JBT1
	SA	21,0202
	AAIJ	\$+1
	TZ	IOOR
	J	BIO3
I01	LIC	2,0,12
	LFC	2,0,13
	W	
I03	LFC	2,0,12
	NUP	
	LOC	2,0,13
	W	
ELAY	DIC	2
	DOC	2
	JK	9,\$+2
	J	DELAY
	AAIJ	WRTA3+1
SWOK	LA	21,JBT1
	SA	21,0202
	AAIJ	0,2
	RES	BOOT+129-\$-E

2	LMJ	5,BOOTI-E
	LMJ	5,NTCH3
	LMJ	5,NTCH4
	RES	7
	LMJ	5,CRDNT
	J	PRLCK
	+0	
	LMJ	7,MFAIL
	RES	2
	AAIJ	BOOTB
	RES	46
	LMJ	7,OPERR
	RES	3
	SZ	26
	LMJ	7,OVER
	LMJ	7,DVCK
	RES	BOOT+201-\$-E
BCCM		-1,65311
BCTF		-1,127
BKEY		+3,0
WCMP		+0007777170000
WPC2		+65535-CLEAR,CLEAR+1
WSYS		+65535,0
WSBT		+224,)
WVLD		+1,LDTBH-E
DTBH		+052000000001
3GWV		+1,WRTBH-E
WRTBH		+012000000004
GWVBS		+1,BSPBH-E
BSPBH		+0300030000000
GA2RW		1,A2RWD-E
A2RWD		+0200010000002
BJINT	J	JINT-E
JBT1	LMJ	5,BOOTI-E
JC	J	C
IDOR	+0	
XSW	+	0
	RES	BOOT+222-\$-E
SYSCD		-1
\$(0)	RES	0170000
XERF	EQU	02460
FREX	EQU	0
PFNDR	+0	
	+1	
UDJ		+0742000
BSPK	+0	
SCUIA	RES	3
MODEI	+0	
IBIT	+0,0400000	
INTWD	LMJ	5,NTCH2
	LMJ	5,NTCH3
	LMJ	5,NTCH4
ACI	ACI	2
	ACI	3
	ACI	4
SZG	SZ	GUARD,,010
	SZ	GUARD,,011
	SZ	GUARD,,012
LFC	LFC	2,GWBSP
	LFC	3,GWBSP
	LFC	4,GWBSP
	LFC	2,GWBSP
	LFC	3,GWBSP
	LFC	4,GWBSP

BSP +0300030000000
 BSPF +J
 SKPIT +0100037777777
 SKPF +0
 GWBSP +01,BSPF
 GWSKP +01,SKPF
 JALT J ALTIJ
 JA J A
 JB J B

CR22 +0
 CUIAT FORM 6,12,18
 CUIA CUIAT 3,1,IRCD A
 CUIAT 4,1,IRCD B
 CUIAT 3,2,IRCD C
 CUIAT 4,2,IRCD D
 CUIAT 3,4,IRCD E
 CUIAT 3,010,IRCD F
 CUIAT 3,020,IRCD G
 CUIAT 3,040,IRCD H
 CUIAT 2,020,IRCD I
 CUIAT 2,040,IRCD J
 CUIAT 4,4,OPRIN
 CUIAT 4,010,OCARD
 +0

IRCD RES 20
 IRCD A RES 20
 IRCD B RES 20
 IRCD C RES 20
 IRCD D RES 20
 IRCD E RES 20
 IRCD F RES 20
 IRCD G RES 20
 IRCD H RES 20
 IRCD I RES 20
 IRCD J RES 20
 OPRIN RES 20

+0050505050505
 +0050505050505

OCARD RES 20
 TCARD RES 20
 TRCARD RES 20

CSIG +01
 TSIG +0,0,0,0,0,1
 TSIGA +0,0,0,0,0,1
 TSIGB +0,0,0,0,0,1
 TSIGC +0,0,0,0,0,1
 TSIGD +0,0,0,0,0,1
 TSIGE +0,0,0,0,0,1
 TSIGF +0,0,0,0,0,1
 TSIGG +0,0,0,0,0,1
 TSIGH +0,0,0,0,0,1
 TSIGI +0,0,0,0,0,1
 TSIGJ +0,0,0,0,0,1
 TSIGK +0,0,0,0,0,1
 TSIGL +0,0,0,0,0,1

COUNT +0
 NTRSG +1
 FL1 +1.0
 FL2 +2.0
 FL3 +3.0
 LIC LIC 2,GWV4
 LIC2 LIC 2,GWV1
 LIC3 LIC 3,GWV2
 LIC4 LIC 4,GWV3

B1 = 3,0
 C1 = 4,0
 B2 = 3,1
 C2 = 4,1
 B3 = 3,2

. BCD CHANNEL 2
 . BCD CHANNEL 3
 . BCD CHANNEL 4

LDC2	LOC	2,GWV1
LDC3	LOC	3,GWV2
LDC4	LOC	4,GWV3
LFC2	LFC	2,GWVD
LFC3	LFC	2,GWVA
LFC4	LFC	3,GWVB
JIC2	W	
JIC3	W	
JIC4	W	
JDC2	W	
JDC3	W	
JDC4	W	
GWV1	+20,0	
GWV2	+20,0	
GWV3	+20,0	
GWVA	+0	
GWVB	+0	
GWVC	+0	
GWV	FORM	+2,16,18
GWV11	GWV	+0,1,RD
GWV12	GWV	+0,1,RD1
GWV13	GWV	+0,1,RD2
GWV14	GWV	+0,1,WD
GWV15	GWV	+0,1,WD1
GWV16	GWV	+0,1,WD2
GWV4	GWV	+0,+20,IRCD
GWVD	GWV	+0,+1,C2DT
BSR	+0300030000000	
RD	+0520020000000	
RB	+0520000000000	
BSF	+0310030000000	
BSR1	+0300030000000	
RD1	+0520020000000	
RB1	+0520000000000	
BSF1	+0310030000000	
BSR2	+0300030000000	
RD2	+0520020000000	
RB2	+0520000000000	
BSF2	+0310030000000	
WEF	+0120030000000	
WD	+0120020000000	
WB	+0120000000000	
REW	+0300010000000	
WEF1	+0120030000000	
WD1	+0120020000000	
WB1	+0120000000000	
REW1	+0300010000000	
WEF2	+0120030000000	
WD2	+0120020000000	
WB2	+0120000000000	
REW2	+0300010000000	
IO5	RES	6
WRTX4	+0	
TW04	+16	
TW02	+4	
LA3	LA	15,CUIA, 2
LX2	LX	2,0,,015
LA16	LA	16,0
L100	+100	
LTRA	+61	
LTRF	+66	
LTRJ	+71	
LTRK	+72	

- BCD CHANNEL 2
- BCD CHANNEL 3
- BCD CHANNEL 4

- BCD CHANNEL 2
- BCD CHANNEL 3
- BCD CHANNEL 4

LTRL	+73	
LTRN	+75	
LTRP	+77	
LTRS	+82	
LTRT	+83	
FCC	+0	
FN	+0	
M1P11	-1,11	
M1P4	-1,4	
MSK	+0777777177777	
ZERO	+0	
EBT	-1,62543	
P1M4	+1,-4	
BUFF	-1,+19	
TDELQ	+0,TFWD	
CHAR	+0200000000000	
QDELQ	+65534-QXTBL	
TWO	+02	
P1M5	+1,-5	
P1M2	+1,-2	
P1Z	+1,0	
M1	-1	
QCONS	-2,65534-QXTBL	
BOUND	+077777-XERF	
ABANK	+0100000-XERF	
BBANK	+0170000+FREX	
BBNKB	+0170001+FREX	
M117	-1,17	
LTRTB	+8300000000	
M11	-1,1	
M12	-1,2	
DQX	-1,200	
M2	-2	
ZPC	+0400400000000	
NOP	NOP	
ZRO	+	0
DNE	+1	
XRC2	SX	2,XR22
XRC3	SX	2,XR23
XRC4	SX	2,XR24
ARGX	+0	
XR22	+0	
XR23	+0	
XR24	+0	
MODE	RES	3
TFWD		+0210421042104
		+0210421042104
		+0525252525252
		+0210421042104
		+0210400000000
		+0525252520000
IOX	EX	I05+1
	EX	I05+3
	EX	I05+5
IDX1	EX	I05
	EX	I05+2
	EX	I05+4
GUARD		+0,0,0,0,0,0
GINST	LA	18,JG-2
JG	J	C2
	J	C3
	J	C4
LGIN	LA	18,LJ-2

LJ	J	LC2
	J	LC3
	J	LC4
BGIN	LA	18,LBJ-2
LBJ	J	LBC2
	J	LBC3
	J	LBC4
PGIN	LA	18,PJ-2
PJ	J	PC2
	J	PC3
	J	PC4
CH266		+0266000000000
TTLP		-1,31
L		+01000
NDQ		-2,0
ERIND		+0
P1P18	+	1,18
INTCE	+	0233000000000
CRD2	+	0520020000002
CRD4	+	0520020000010
CRD6	+	0520020000040
CRDT	+	0
TREY	+	3
EIGHT	+	8
LMJI	LMJ	5,NTCH2
	LMJ	7,OPERR
	NOP	
	LMJ	7,OVER
	LMJ	7,DVCK
OVER	SLJ	PAUSE
	LA	19,0100000-XERF,,02
	TNE	19,U0J
	J	0100010-XERF
	LX	5,ZERO
	J	IERIT
DVCK	SLJ	PAUSE
	LX	5,4,,017
	J	IERIT
MFAIL	SLJ	PAUSE
	LX	5,6,,017
	J	IERIT
TFAIL	SLJ	PAUSE
	LX	5,8,,017
	J	IERIT
BADF	SLJ	PAUSE
	LX	5,10,,017
	J	IERIT
OPERR	SLJ	PAUSE
	LA	19,7
	AND	19,0177777,,016
	TG	20,0170000,,016
	J	\$+3
	TG	20,0100000-XERF,,016
	ANA	20,0100000-XERF,,016
	ANA	20,1,,016
	SLJ	ALTER
	ANA	20,ONE
	LA	19,WORD
	SA	19,REPRT+12
	LX	5,12,,017
IERIT	SLJ	CRGE
	LA	20,REPRT+1,5
	LA	19,REPRT,5
	SLJ	IOTYP

	LA	19,5,,017
	LA	20,11,,017
	TW	19,5
	J	\$+4
	SX	7,PFNDR
	LX	5,3,,017
	J	\$+2
	SZ	5
	LA	20,PATH+2,5
	LA	19,PATH+1,5
	SLJ	IOTYP
	LA	19,PFNDR
	AND	19,077777,,016
	SLJ	ALTER
	LA	20,05,,017
	SSC	20,6
	LA	19,WORD
	SSL	19,6
	DSC	19,66
	LA	20,PATH,5
	SLJ	IOTYP
	AACI	
	AAIJ	\$+1
DEBUG	LA	19,0100000-XERF,,02
	TNE	19,UOJ
	J	STALL
	J	PRHLT
FHLT	LX	7,FSTOP+1,,016
	J	YESM
PRHLT	SZ	NORES
	LA	14,PRHLT-1
	SA	14,PRHLT
	SX	7,127
	LX	7,PRHLT,,016
STALL	SLJ	CRGE
	LIC	15,OPTR
	JIC	15,\$
	LOC	15,OPTR
	JOC	15,\$
SUPER	LA	12,EQUAL,,010
	TE	12,0,,016
	J	STALL
	LA	12,P1Z
	SZ	CKT
	SZ	TYPIN,12
TYPCA	LIC	15,OPTR
	JIC	15,\$
	LOC	15,OPTR
	JOC	15,\$
	LA	13,EQUAL,,010
	TNE	13,076,,016
	J	STALL
	TNE	13,04,,016
	J	DCODE
	LA	14,TYPIN,12
	SSC	14,30
	SA	14,TYPIN,12
	SA	13,TYPIN,12,010
	LA	13,ONE
	AA	13,CKT
	SA	13,CKT
	TG	13,6,,016
	J	\$+2
	J	TYPCA

	TLEM	12,3,,016
	J	TYPCA-2
	J	TYPCA-3
DCODE	LA	13,TYPIN,,01
	TNE	13,TYPE1A
	J	RESUM
	LA	13,TYPIN,,02
	TNE	13,TYPE2
	J	EOFIT
	TE	13,TYPE3
	J	STALL
	SX	7,RAR7B
	LA	13,NORES
	SA	13,RAR7A
	LA	13,JRAR7
	SA	13,STALL
	LA	13,TYPIN,,05
	SA	13,TYPIN+1,,07
	LA	13,TYPIN+1
	LX	8,M1P5
	DSL	13,3
	SSL	13,3
	JMGI	8,\$-2
	SSL	14,18
	AA	14,ABANK
	TG	14,0170000,,016
	J	STALL
	J	0,14
RAR7	LX	7,RAR7B
	LA	13,THJOE
	SA	13,STALL
	LA	13,RAR7A
	SA	13,NORES
	J	STALL
RAR7A	+0	
RAR7B	+0	
JRAR7	J	RAR7
THJOE	SLJ	CRGE
EOFIT	LA	13,TYPIN+1,,010
	ANU	13,060,,016
	LA	13,TYPIN,,010
	ANA	13,060,,016
	TZ	13
	AA	14,10,,016
	TG	14,12,,016
	J	STALL
	ANA	14,36,,016
	SN	14,\$+2,,010
	LA	14,1,,016
	SSC	14,0
	SA	14,GWVEF+1,,01
	SA	14,CUIA+12,,02
	LA	13,TYPIN,,011
	DSL	13,3
	SSL	14,33
	TLE	14,2,,016
	J	STALL
	TG	14,5,,016
	J	STALL
	SA	14,CUIA+12,,015
	LA	13,12,,016
	SA	13,XR22-2,14
	LA	13,1,,016
	SA	13,MODE-2,14

	LA	12,14
	SSC	12,14
	ANA	14,2,,016
	SSC	14,35
	OR	12,LFCEF
	SA	13,I05,14
	LA	13,NOP
	SA	13,I05+1,14
	EX	I05,14
	W	
	J	STALL
RESUM	TZ	NORES
	J	0,7
	J	STALL
TNTRK	SLJ	CRGE
	AA	12,06060,,016
	SSC	12,30
	AA	12,05,,016
	SA	12,TELL,,02
	LA	20,TELL+1
	LA	19,TELL
	SLJ	IOTYP
	J	STALL
YESM	SLJ	CRGE
	LA	20,YESS+1
	LA	19,YESS
	SLJ	IOTYP
	J	STALL
EQUAL	+0	
OPTR	+1,EQUAL	
JTYPA	J	TYPCA
TYPIN	RES	4
TYPE1A	+0271230	
TYPE2	+0122413	
TYPE3	+0312706	
CKT	+0	
NORES	+1	
M1P5	-1,5	
LFCEF	LFC	0,GWVEF
GWVEF	+1,\$+1	
	+0120030000000	
TELL	-	KCO-
	-	LRETN-
YESS	-	-
	-	ELDI-
CRGV1	+14,ICRD	
CRGV2	+1,CRGV3	
CRGV3	+0520000000000	
ALTER	J	0
	LX	6,M1P4
	SZ	WORD
	SZ	19
	DI	19,10,,017
	AA	20,060,,017
	AA	20,WORD
	SSC	20,30
	SA	20,WORD
	DSL	19,36
	JMGI	6,\$-6
	J	ALTER
IDTYP	J	0
	LX	6,M1P11
	SA	20,WORD
	LOC	15,GWTP

	DSL	19,6
	JOC	15,\$
	JMGI	6,\$-4
	J	IOTYP
CRGE	J	0
	LA	19,CC
	SA	19,WORD
	LOC	15,GWTYP
	SSL	19,6
	SA	19,WORD
	JOC	15,\$
	LOC	15,GWTYP
	JOC	15,\$
	J	CRGE
CC	+-	-
WORD	+0	
GWTYP	+1,WORD	
REPRT	-	WO-
	-	LFREVO-
	-	WOL-
	-	FREDNU-
	-	KCEHC -
	-	EDIVID-
	-	RORRE-
	-	OVRES-
	-	ERULIA-
	-	F EPAT-
	-	O/I L-
	-	AGELLI-
	-	-
	-	DNE-
PATH	-	SDAER -
	-	REDNIF-
	-	HTAP -
	-	NOITAC-
	-	OL MAR-
	-	GORP -
CLEAR	LA	25,1,,017
	SA	25,OCIND
	J	OPK2
ATL	SZ	5
	JK	12,MYS
	J	TYPE1
LTL	LX	5,3,,017
	JK	12,MYS
	J	TYPE1
EROP	LX	5,6,,017
	JK	12,MYS
	J	TYPE1
TMQ	LX	5,9,,017
	JK	12,MYS
	J	TYPE1
A2EOF	LX	1,1,,017
	LX	5,12,,017
TYPE1	SLJ	CRGE
	LA	20,NOTES+2,5
	LA	19,NOTES+1,5
	SLJ	IOTYP
	LA	20,NOTES,5
	LA	19,LINE
	SLJ	IOTYP
	LA	20,RECND
	SLJ	ALTER
	LA	20,WORD

	SZ	19
	SLJ	IOTYP
	JK	12,MYS
	HJ	\$-1
CRDN1	-RORRE -	
	-YFIREV-	
CRDN2	-EDOC L-	
	-AGELLI-	
NOTES	- EGRAL-	
	- OOT S-	
	-SERDDA-	
	- DETS-	
	-UAHXE -	
	-YROMEM-	
	- DNA-	
	-MMOC L-	
	-AGELLI-	
	- EGRAL-	
	- OOT E-	
	-LBAT Q-	
	-EPAT C-	
	-ITSYM -	
	-NO FOE-	
LINE	- ENIL -	
CARD	- DRAC -	
NZ	+0400400000000	
INTA	LX	6,CR22
	LX	6,CR22
	SX	6,SCUIA+1
	SX	5,SCUIA+2
ALTJ	SZ	19
	LA	19,201,,015
	TE	19,040,,016
	J	TESTM
SWOK	LA	19,INTWA
	SA	19,130
	LA	19,01,,017
	AA	19,RECND
	SA	19,RECND
	SZ	GUARD,,010
	LX	5,SCUIA+2
	SZ	BSPK
	AACI	
	AAIJ	0,5
TESTM	SZ	19
	LA	19,201,,015
	SSL	19,2
	TNE	19,016,,016
	JK	8,SWOK
	TNE	19,013,,016
	J	A2EOF
	TE	19,017,,016
	J	ERRLG
	LA	12,0200,,016
	LMJ	7,TNTRK
	AACI	
	TZ	TSIG,,010
	AAIJ	EXA21
	AAIJ	EXA22
ERRLG	LA	19,1,,016
	AA	19,BSPK
	TNE	19,11,,016
	J	TFAIL
	SA	19,BSPK

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      LA      19,JC
      SA      19,130
      AACI
      AAIJ    $+1
      LFC     2,A2BSP
      W
C      LA      19,201,,015
      SSL     19,2
      TE      19,010,,016
      J       TFAIL
      LA      19,ALTJP
      SA      19,130
      AACI
      TZ      TSIG,010
      AAIJ    EXA21
      AAIJ    EXA22
A2BSP  +1,$+1
      +03000300000010
RECNO  +0
CRDNO  +0
ALTJP  J      ALTJ
INTWA  LMJ     5,INTA
A3R    +1,A3RWD
A3RWD  +0300010000004
      .      PCID
      .      PERIPHERAL CARD IMAGE
      .      DECODER
PCID   J      PCID1
RCRDE  RES    20
PCID1  SX     3,PCID1+1,,1
      NOP
      LA 014,PCID1+1,,1
      AA 014,+1,,016
      SA 014,BOX,,1
      SZ   CWL
      LA   014,0,3
      SA   014,CWL,,01
      DSL  014,18
      SA   014,NUMEF,,1
      SA   014,ALFE5,,01
      LX   1,P1M1
      LX 2,+0,,016
      SZ   FLDNOE
PCID2  LMJ   11,DRE
      LA 015,+1,,016
      SA 015,SGNE
      TNZ  NE
      J    BOX
      SZ   WE
      LA   015,MONE
      SA   015,NE,,2
      TNZ  KE
      J    NUME
      LA   015,KE
      TNE 015,TWO
      J    ALFE
      TG 015,TWO
      J    SKPE
NUME   LX     11,NE
      J    NUME3
NUME1  LA     016,RCRDE,1
      SA     016,INPE
      LX     2,M1P6

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NUME2	SZ	017
	LA	016,INPE
	DSL	016,036
	SA	017,INPE
	TNE	016,012,,016
	SZ	016
	TNE	016,020,,016
	SZ	016
	TNE	016,NINE
	J	NUME2A
	TG	016,NINE
	J	NUME6
NUME2A	AA	016,WE
	SA	016,WE
NUME2B	TLEM	11,2,,016
	J	NUME4
	MSI	016,P10
	SA	016,WE
NUME3	TLEM	2,2,,016
	J	\$+2
	J	NUME2
	TLEM	1,1,,016
	J	NUME1
	SLJ	RARE
	J	NUME1
NUME4	LA	017,SGNE
NUME5	TNZ	OCIND
	J	PCFLTE-1
	TNZ	SGNE
	SN	016,016
NUMEF	SA	016,FILL
	J	BUMPE
NUME6	DSL	016,6
	LA	016,11
	TNE	016,NE
	J	NUME7
	TG	016,NE
	J	\$+1
	J	ERRE
NUME7	DSL	017,042
	TNE	017,TWO
	J	NUME8
	TG	017,TWO
	J	\$+1
	J	NUME9
NUME8	SZ	SGNE
NUME9	LA	015,WE
	TLEM	11,1,,016
	J	NUME4
	J	NUME3
	LA	015,016
PCFLTE	LX	11,NUMEF,,1
	OR	015,CH233
	FA	016,ZERJ
	TNZ	SGNE
	SN	016,016
	TOP	016,ZPC
	SZ	016
	SA	016,0,11
	J	BUMPE
ALFE	LX	11,NE
	J	ALFE3

ALFE1	LA	015,RCRDE,1
	SA	015,INPE
	LX	2,M1P6
ALFE2	LA	015,INPE
	DSL	015,036
	SA	016,INPE
	AA	015,TBLE,,016
	SA	015,\$+1,,1
	LA	015,FILL
	AA	015,WE
	SA	015,WE
	TLEM	11,2,,016
	J	ALFE4
	MSI	015,PHUN
	SA	015,WE
ALFE3	TLEM	2,2,,015
	J	\$+2
	J	ALFE2
	TLEM	1,1,,015
	J	ALFE1
	SLJ	RARE
	J	ALFE1
ALFE4	LA	017,1,,017
	TNZ	OCIND
	J	PCFLTE
ALFE5	SA	015,FILL
	J	BUMPE
SKPE	LX	11,NE
	J	SKPE3
SKPE1	LA	015,RCRDE,1
	SA	015,INPE
	LX	2,M1P6
SKPE2	LA	015,INPE
	SZ	016
	DSL	015,036
	SA	016,INPE
	TLEM	11,2,,016
	J	BUMPE1
SKPE3	TLEM	2,2,,015
	J	\$+2
	J	SKPE2
	TLEM	1,1,,015
	J	SKPE1
	SLJ	RARE
	J	SKPE1
BUMPE	LA	015,NUMEF
	AA	015,ONE
	SA	015,NUMEF,,1
	SA	015,ALFE5,,1
BUMPE1	LA	015,ERIND
	DSL	015,043
	SA	016,ERIND
	J	PCID2
ERRE	LA	015,ERIND
	OR	015,ONE
	SA	016,ERIND
	J	NUME2A
DRE	SX	1,DRXE1
	LX	1,FLDNOE
	SX	11,DRXE,,01
	JMGI	1,DRE1
	LA	014,CWL
	JN	014,DRXE+1
	LX	1,M1P17

	LA	015,0,4
	SA	015,TEMPE1
	LA	015,1,4
	SA	015,TEMPE2
	LA	015,2,4
	SA	015,TEMPE3
	AX	4,TREY
	LA	014,CWL
	ANA	014,ONE
	SA	014,CWL
DRE1	LA	014,TEMPE1
	SZ	015
	DSL	014,040
	SA	014,NE
	LA	016,TEMPE2
	SZ	017
	DSL	016,040
	SA	017,TEMPE2
LR		66,MASK
	MLU	016,015
	SA	017,TEMPE1
	LA	014,TEMPE3
	SZ	015
	DSL	014,042
	SA	014,KE
	SA	015,TEMPE3
	SX	1,FLDNOE
	LX	1,DRXE1
DRXE	J	
	SZ	NE
	J	DRXE
RARE	J	0
	SX	1,DRREC
	LA	021,DRREC
	TE	021,20,,016
	J	RARE
BOX	J	
MASK	+	0777777777760
MIP29	-1,+29	
MIP18	+	-1,18
PHUN	+	100
P10	+	10
MIP6	+	-1,6
NINE	+	9
TEN	+	10
WE	+	0
NE	+	0
KE	+	0
INPE	+	0
SGNE	+	0
AMP	+20	
MZR	+	052
CWL	+	0
FLDNOE	+	0
DRXE1	+	0
P1M1	+	1.-1
DRREC	+0	
TBLE	+	0
	+	91
	+	92
	+	93
	+	94
	+	95
	+	96

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+ 97
+ 98
+ 99
+ 90
+ 48
+ 49
+ 0
+ 0
+ 0
+ 0
+ 31
+ 82
+ 83
+ 84
+ 85
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+ 78
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+ 61
+ 62
+ 63
+ 64
+ 65
+ 66
+ 67
+ 68
+ 69
+ 0
+ 18
+ 19
+ 0
+ 0
+ 0
MDNE + 000000077776
MINUS1 + -1
FILL EQU 32767
TEMPE1 + 0
TEMPE2 + 0
TEMPE3 + 0

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TBL3C	+	00	
	+	00	
	+	00	
	+	00	
	+	020	.BLANK
	+	061	.A
	+	062	.B
	+	063	.C
	+	064	.D
	+	065	.E
	+	066	.F
	+	067	.G
	+	070	.H
	+	071	.I
	+	041	.J
	+	042	.K
	+	043	.L
	+	044	.M
	+	045	.N
	+	046	.O
	+	047	.P
	+	050	.Q
	+	051	.R
	+	022	.S
	+	023	.T
	+	024	.U
	+	025	.V
	+	026	.W
	+	027	.X
	+	030	.Y
	+	031	.Z
	+	074	.)
	+	040	.MINUS SIGN
	+	060	.+
	+	00	.L
	+	013	.=
	+	00	.
	+	00	.
	+	053	.\$
	+	054	.*
	+	034	.(
	+	00	.
	+	00	.
	+	00	.
	+	00	.
	+	033	.,
	+	00	.
	+	012	.0
	+	01	.1
	+	02	.2
	+	03	.3
	+	04	.4
	+	05	.5
	+	06	.6
	+	07	.7
	+	010	.12
	+	011	.11
	+	014	APOSTROPHE
	+	00	.
	+	021	/
	+	073	..
	+	00	.
	+	00	.=

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PAUSE    J      0
          J      $-1
TLOD     LA     25,ONE
          SA     25,NTRSG
          SX     4,TLODY,,1
          LX     4,TLODY
          LX     11,TLODX
TLOD1    LA     27,0,*4
          SA     27,TITLE+29,11
          JN     27,TLOD2
          JMGI   11,TLOD2
          J      TLOD1
TLOD2    LN     25,27
          TOP    25,ZPC
          SZ     25
          SA     25,TITLE+29,11
          SZ     25
          JMGI   11,0,4
          NOP
          SA     25,TITLE+29,11
          J      $-3
SUBR     +1,0
          LX     12,SUBR
          NOP
          LA     25,0,*12
          SA     25,0100003-XERF,1
          LA     25,0,*12
          SA     25,0100002-XERF,1
          XOR    12,FAND
          SA     13,0100001-XERF,1
SWTCH    SX     1,PFNDR
FSTOP    JK     10,FHLT
          JK     14,WRTA3
          J      0100000-XERF,1
FAND     +0742001,0
SWCTR    +0
TLODX    +1,-29
TLODY    +1,0
TITLE    RES    30
INT3A    J      $
GO       LX     4,G02,,016
          LMJ    3,PCID
          +OP,0
          LA     25,OP
          LX     1,OP
          AA     25,CH233
          SA     25,PFNDR
GOA      J      RDIO
G02      +0152000000000
          +0
          +0640000,0
DCIND    +0
CH233    +0233000000000
SW1      +      0
MYS      LA     014,X
          SA     014,XP
          LA     014,OP
          SA     014,PRVJP
          LMJ    3,ALDT
          +OP,0
          +      0040000000000
          +0000000000000
          +0400000000000
          LA     014,PRVJP

```


	+	0
	+	0
	+	0
	+	0
	+	0
	J	OPA
	J	OPB
	J	OPC
	J	OPD
	J	OPE
	J	OPF
	J	OPG
	J	OPH
	J	OPI
	J	EROP
	J	OPJ
	J	OPK
	J	OPL
	J	OPM
	J	OPN
	J	OPO
	J	OPP
	J	OPQ
	J	OPR
	J	EROP
	J	EROP
	J	OPS
	J	OPT
	J	OPU
	J	OPV
	J	OPW
	J	OPX
	J	OPY
	J	OPZ
	J	OP0
	J	OP1
	J	OP2
	J	OP3
	J	OP4
	J	OP5
	J	OP6
	J	OP7
	J	OP8
	J	OP9
OPLOZ	J	EROP
OPDOL	J	EROP
OPMIN	J	EROP
OPSLS	J	EROP
OPPER	J	EROP
OPNUM	J	EROP
OPAT	J	EROP
OPY	J	EROP
OP0	J	EROP
OP1	J	EROP
OP2	J	EROP
OP4	J	EROP
OP5	J	EROP
OP6	J	EROP
OP7	J	EROP
OP8	J	EROP
OP9	J	EROP
OPDOT	SLJ	OT8
	TZ	SW1
	J	TNOW

	LA	20,1,,016
	SA	20,SW1
	LA	20,CRD6
	SA	20,CRDT
	J	MYS
TNOW	SZ	SW1
	LA	20,CRD2
	SA	20,CRDT
	J	MYS
OPAMP	SLJ	OTAMP
	J	OPT2
OPST	J	MYS
OPCOM	J	EROP
OP3	J	GO
OPA	SLJ	OTA
	LA	26,LA
	AH	26,Z
	SLJ	LOC
	LA	26,FA
	AH	26,Y
OPA1	SLJ	LOC
	LA	26,TOP
	SLJ	LOC
	LA	26,SZ
OPA2	SLJ	LOC
	LA	26,SA
	AH	26,X
	SLJ	LOC
	J	MYS
OPB	SLJ	OTB
	LA	26,J
	LA	12,X
	AH	26,L
	SA	26,0,12
	J	MYS
OPC	SLJ	OTC
	LA	26,LA
	AH	26,Y
	SLJ	LOC
	LA	26,LX1
	AH	26,Z
	ANH	26,ABANK
	SLJ	LOC
	LA	26,TLE
	AH	26,X
	SLJ	LOC
	LA	26,JSW
	SLJ	LOC
	LA	26,W
	JZ	26,MYS
	AH	26,LX1
	ANH	26,ABANK
	SLJ	LOC
	LA	26,TE
	AH	26,X
OPC2	SLJ	LOC
	LA	26,JSW
	SLJ	LOC
	J	MYS
OPD	SLJ	OTA
	LA	26,LA
	AH	26,Y
	SLJ	LOC
	LA	26,FD

	SLJ	LOC	
	J	MYS	
OP I	SLJ	OTI	
	LA	26,LA	
	AH	26,L	
	AH	26,TREY	
	SLJ	LOC	
	LA	26,SA	
	AH	26,X	
	SLJ	LOC	
	LA	26,J	
	AH	26,L	
	AH	26,TWO	
	SLJ	LOC	
	SLJ	IVC	
	SLJ	LOC	
	J	MYS	
OP J	LMJ	7,EROP	
	SZ	26	
	SLJ	LOC	
	J	MYS	
OPK	SLJ	OTK	
	LA	26,X	
	JZ	26,OPK1	
	AA	26,KEY	
	TG	26,BBNK3	
	J	ATL	
OPK1	SA	26,KEY	
	SZ	NOQ,,01	
OPK2	LX	10,QCONS	
	LA	26,M1	
	SA	26,QXTBL,10	
	JMGI	10,\$-2	
	J	MYS	
OPL	SLJ	OTL	
	LA	26,Z	
	TE	26,LTRP	. PRINTER
	J	\$+3	
	LX	2,2,,015	
	J	OPL1	
	TE	26,LTRT	. TAPE
	J	\$+3	
	LX	2,3,,015	
	J	OPL1	
	LX	2,1,,015	. CARD
OPL1	SZ	26	
	LA	27,W	
	DI	26,L100	
	TLEM	2,2,,015	
	LA	26,70,,016	
	SA	26,W	
	JNZ	27,OPLA	
	LA	26,W	
	JZ	26,\$+2	
	ANA	26,LTRA	
	NOP		
	AA	26,LX2	. LX 2,CU,,016
	SLJ	LOC	
	LA	26,LA16	
	AA	26,Y	
	SLJ	LOC	
	LA	26,LA3	. LA 15,CUIA,2
	SLJ	LOC	
	LA	26,OPLD,2	. LMJ LDT,4

	AH	26,Z
	SLJ	LOC
	LA	26,NOP
	J	OPA2
OPE	SLJ	OTB
	LA	26,X,,01
	ANA	26,ABANK
	AH	26,LX1
	J	OPC2
OPF	SLJ	OTA
	LA	26,LX1
	AH	26,Y
	ANH	26,ABANK
	SLJ	LOC
	LA	26,LMJS4
	SLJ	LOC
	LNA	25,Y
	AA	25,X
	OR	25,CH233
	JP	25,\$+2
	XOR	25,CH233
	FA	26,ZERO
	TOP	26,ZPC
	SZ	26
	SLJ	LOC
	LNA	25,Y
	AA	25,Z
	OR	25,CH233
	JP	25,\$+2
	XOR	25,CH233
	FA	26,ZERO
	TOP	26,ZPC
	SZ	26
	SLJ	LOC
	J	MYS
OPG	SLJ	OTA
	LA	26,LA12
	AH	26,Z
	SLJ	LOC
	LA	26,FA12
	SLJ	LOC
	LA	26,NOP
	SLJ	LOC
	LA	26,LA12X
	AH	26,Y
	SLJ	LOC
	LA	26,SA12
	AH	26,X
	SLJ	LOC
	J	MYS
OPH	SLJ	OTA
	LA	26,LA12
	AH	26,Y
	SLJ	LOC
	LA	26,FA12
	SLJ	LOC
	LA	26,NOP
	SLJ	LOC
	LA	26,LA12
	AH	26,Z
	SLJ	LOC
	LA	26,SA12X
	AH	26,X

	SLJ	LOC
	J	OPLP
OPLA	LA	26,W
	JZ	26,\$+2
	ANA	26,LTRA
	AA	26,LX2
	SLJ	LOC
	LA	26,NOP
	SLJ	LOC
	LA	26,LA3
	SLJ	LOC
	LA	26,OPLD1,2
	SLJ	LOC
	LA	26,X,,1
	SSC	26,18
	AH	26,Y
	SLJ	LOC
	J	MYS
OPLD	LMJ	4,LDT
	LMJ	4,LDC
	LMJ	4,LDT
	LMJ	4,LDT
OPLD1	LMJ	4,LBT
	LMJ	4,LBT
	LMJ	4,LBT
	LMJ	4,LBT
OPLP	LA	26,W1
	SA	26,FCC
	SSC	26,18
	AH	26,X
	SLJ	LOC
OPLP1	LX	2,P1M1
	LX	3,P1Z
	SZ	FN
	LA	24,W2+1,,017
	SA	24,OPLPA,,01
OPLPA	LA	27,W2+2,2
	SZ	26
	DI	26,10000,,017
	AA	26,FN
	MSI	26,TW04
	SA	26,FN
	SZ	26
	DI	26,100,,017
	AA	26,FN
	MSI	26,TW04
	AA	26,27
	JMGI	2,\$+4
	MSI	26,TW04
	SA	26,FN
	J	OPLPA
	SLJ	LOC
	SZ	FN
	JMGI	3,OPLPJ
	LA	26,W2+4,,017
	SA	26,OPLPA,,1
	LX	2,P1M1
	J	OPLPA
OPLPJ	LX	2,P1M4
OPLPK	SZ	26
	LA	27,W2+10,2
	DI	26,10000,,017
	SLJ	CLT
	AA	26,FN

	MSI	26,TW02
	SA	26,FN
	SZ	26
	DI	26,100,,017
	SLJ	CLT
	AA	26,FN
	MSI	26,TW02
	SA	26,FN
	LA	26,27
	SLJ	CLT
	AA	26,FN
	JMGI	2,\$+4
	MSI	26,TW02
	SA	26,FN
	J	OPLPK
	SLJ	LOC
OPLPP	LA	26,FCC
	JZ	26,MYS
	ANA	26,1,,017
	SA	26,FCC
OPLPO	LMJ	3,ALDT
	+	W2,ERIND
	+	0742631463143
	+	0146314500000
	+	0752526525000
	J	OPLP1
CLT	J	\$
	TE	26,LTRF
	J	\$+3
	SZ	26
	J	CLT
	TE	26,LTRN
	J	\$+3
	LA	26,1,,017
	J	CLT
	TE	26,LTRA
	J	\$+3
	LA	26,2,,017
	J	CLT
	TE	26,LTRS
	J	\$+3
	LA	26,3,,017
	J	CLT
	SZ	26
	J	CLT
OPM	SLJ	OTA
	LA	26,LA
	AH	26,Y
	SLJ	LOC
	LA	26,FM
	AH	26,Z
	SLJ	LOC
	LA	26,NOP
	J	OPA2
OPN	SLJ	OTB
	LA	26,LA
	AH	26,L
	AH	26,TW0
	SLJ	LOC
	LA	26,SA
	AH	26,X
	SLJ	LOC
	LA	26,J
	AH	26,L

	AH	26,ONE
	SLJ	LOC
	J	MYS
OPD	J	MYS
OPP	SLJ	OTL
	LA	26,Z
	TE	26,LTRP
	J	\$+3
	LX	2,2,,017
	J	OPP1
	TE	26,LTRT
	J	\$+3
	LX	2,3,,017
	J	OPP1
OPP1	LX	2,1,,017
	SZ	26
	LA	27,W
	DI	26,L100
	TLEM	2,3,,017
	J	\$+2
	J	OPP2
	TLEM	2,2,,017
	J	\$+3
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	J	OPP2
OPP2	LA	26,LTRK
	SA	26,W
	JZ	27,OPPA
	LA	26,W
	JZ	26,\$+2
	ANA	26,LTRA
	AA	26,LX2
	SLJ	LOC
	LA	26,NOP
	SLJ	LOC
	LA	26,LA3
	SLJ	LOC
	LA	26,OPPD1,2
	SLJ	LOC
	LA	26,X,,1
	SSC	26,18
	AH	26,Y
	SLJ	LOC
	J	MYS
OPPA	LA	26,W
	JZ	26,\$+2
	ANA	26,LTRA
	AA	26,LX2
	SLJ	LOC
	LA	26,LA16
	AA	26,Y
	SLJ	LOC
	LA	26,LA3
	SLJ	LOC
	LA	26,OPPD,2
	SLJ	LOC
	J	OPLP
OPPD	LMJ	4,WRT
	LMJ	4,WRT
	LMJ	4,PRYNT
	LMJ	4,WRT
OPPD1	LMJ	4,PBT
	LMJ	4,PBT

	LMJ	4,PBT
	LMJ	4,PBT
OPQ	SLJ	OTQ
	LA	15,TWO
	AH	15,NOQ
	TG	15,QDELQ
	J	TMQ
	LA	26,X
	SA	26,QXTBL-2,15
	LA	26,Y
	SA	26,QXTBL-1,15
	SA	15,NOQ,,01
	J	MYS
OPR	SLJ	OTR
	LA	26,LA
	AH	26,Y
	J	OPA2
OPS	SLJ	OTA
	LA	26,LA
	AH	26,Y
	SLJ	LOC
	LA	26,FAN
	AH	26,Z
	J	OPA1
OPT	SLJ	OTT
	LA	26,LMJ4T
	LX	8,P1P18
	SLJ	LOC
	SZ	TTL,8
	TLEM	8,29,,016
	J	\$-2
	J	MYS
OPT1	LA	25,OP
	ANA	25,AMP
	JZ	25,OPAMP
OPT2	LX	7,P1Z
	LA	25,TTL+17
	MSI	25,100,,016
	AU	25,TTL+18
	SA	26,TTL+17
	LA	25,TTL+19,7
	SA	25,TTL+18,7
	TLEM	7,11,,016
	J	\$-3
	LX	8,M1P29
OPT2B	LX	7,P1Z
	LA	25,TTL,8
	JNZ	25,\$+3
	JMGI	8,OPT2B
	SZ	8
	SN	25,26
	SA	26,TTL,8
OPT3	LA	25,TTL,7
	JP	25,OPT4
	XOR	25,INTCE
	FA	26,ZRO
	TOP	26,NZ
	SN	26,26
	SA	26,TTL,7
	SLJ	LOC
	J	OPT5
OPT4	OR	25,INTCE
	FA	26,ZRO
	TOP	26,NZ

	SZ	26
	SLJ	LOC
	TLEM	7,29,,016
	J	OPT3
OPT5	LA	014,OP
	ANA	014,AMP
	JZ	014,MYS
	J	MYS2
LMJ4T	LMJ	4,TLOD
TTL	RES	32
OPU	SLJ	OTR
	LA	26,LA
	AH	26,Y
	SLJ	LOC
	LA	26,FACH2
	SLJ	LOC
	LA	26,FACH3
	J	OPA1
OPV	SLJ	OTI
	LA	26,X
	SA	26,OPV1,,01
	SLJ	IVC
OPV1	SA	26,0
	J	MYS
OPW	SLJ	OTW
	LA	26,X
	SA	26,OPW1,,01
	LA	25,Y
	OR	25,CH233
	FA	26,ZERO
OPW1	SA	26,0
	J	MYS
OPX	LMJ	7,EROP
	SZ	26
	SLJ	LOC
	J	MYS
OPZ	SLJ	OTR
	LA	26,LA
	AH	26,Y
	SLJ	LOC
	LA	26,AA
	AH	26,X
	J	OPA2
LA	LA	26,0
FA	FA	26,0
TOP	TOP	26,NZ
SZ	SZ	26
FIVER	+5	
TLE	TLE	26,0
TE	TE	26,0
TNZ	TNZ	0
TZ	TZ	0
SA	SA	26,0
J	J	0
LN	LN	26,0
AA	AA	26,0
JZ	JZ	26,0
LX1	LX	1,0,,015
JP	JP	26,0
JSW	J	SWTCH
JPSWT	JP	26,SWTC1
JN	JN	26,0
FD	FD	26,0
LX11	LX	11,0,,016

LMJS4	SLJ	SUBR
LA12	LA	12,0
FA12	FA	12,CH265
LA12X	LA	12,0,13
SA12	SA	12,0
SA12X	SA	12,0,13
FM	FM	26,0
FAN	FAN	26,0
FACH	FA	26,CH265
FACH2	FA	26,CH233
FACH3	FA	26,ZERO
IVC	J	\$
	LA	25,Z
	OR	25,CH233
	FA	26,ZERO
	LA	12,8,,017
	ANA	12,W
	JZ	12,IVC1
	JP	12,IVC2
	SN	12,12
	NOP	
	FM	26,IVTBL,12
IVC1	LA	25,024,,017
	TLE	25,Y
	SN	26,26
	TUP	26,ZPC
	SZ	26
	J	IVC
IVC2	FD	26,IVTBL,12
	J	IVC1
IVTBL		+0201400000000
		+0204500000000
		+0207620000000
		+0212764000000
		+0216470400000
		+0221606500000
		+0224750220000
		+0230461132000
		+0233575360400
		+0236734654500
		+0242452013710
		+0245564416672
		+0250721522451
		+0254443023471
		+0257553630410
		+0262706576512
		+0266434157116
		+0271543212741
		+0274674055532
		+0300425434430
		+0303532743536
		+0306661534466
		+0312417031702
		+0315522640262
		+0320647410336
		+0324410545213
		+0327512676456
		+0332635456171
		+0336402374714
		+0341503074077
		+0344623713116
		+0347770675742
		+0353473426555
		+0356612334311

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+0361755023373
+0365464114135
+0370601137164
+0373741367021
+0377454732313
OTAMP  J      0
      LMJ      4,$+4
      +0042421042104
      +0210421000000
      +0725252525000
      LMJ      3,PCID
      +TTL+18,ERIND
      LX      10,TTLP
      NOP
      LMA      26,TTL,10
      SA      26,TTL,10
      JMGI     10,$-3
      J      OTAMP
OTA     J      0
      LMJ      4,$+4
      +0052524000000
      +0
      +0652400000000
      LX      10,M12
      LMJ      3,PCID
      +X,ERIND
OTA1    NOP
      LA      26,X,10
      SLJ     DCD
      SA      26,X,10
      JMGI     10,OTA1
      J      OTA
OTB     J      0
      LMJ      4,$+4
      +0052000000000
      +0
      +0640000000000
      LMJ      3,PCID
      +X,ERIND
      TNZ     X
      J      OTB
      LA      26,X
      SLJ     DCD
      SA      26,X
      J      OTB
OTC     J      0
      LMJ      4,$+4
      +0052525200000
      +0
      +0652400000000
      LX      10,M12
      LMJ      3,PCID
      +X,ERIND
OTC1    NOP
      LA      26,X,10
      SLJ     DCD
      SA      26,X,10
      JMGI     10,OTC1
      LA      26,W
      JZ      26,OTC
      SLJ     DCD
      SA      26,W
      J      OTC

```

EXIT IF OPDOT

OTI J 0
 LMJ 4,\$+4
 +00521406000000
 +0
 +06624000000000
 LMJ 3,PCID
 +X,ERIND
 LA 26,X
 SLJ DCD
 SA 26,X
 J OTI
 OTK J 0
 LMJ 4,\$+4
 +00520000000000
 +0
 +06400000000000
 LMJ 3,PCID
 +X,ERIND
 J OTK
 OTL J OTL
 LMJ 4,\$+4
 +0052504423146
 +0314614631463
 +0655125255252
 LX 10,M11
 LMJ 3,PCID
 +X,0
 OTL1 NOP
 LA 26,X,10
 SLJ DCD
 SA 26,X,10
 JMGI 10,OTL1
 J OTL
 OTQ J 0
 LMJ 4,\$+4
 +00525000000000
 +0
 +06500000000000
 LMJ 3,PCID
 +X,ERIND
 J OTQ
 OTR J 0
 LMJ 4,\$+4
 +00525000000000
 +0
 +06500000000000
 LX 10,M11
 LMJ 3,PCID
 +X,ERIND
 OTR1 NOP
 LA 26,X,10
 SLJ DCD
 SA 26,X,10
 JMGI 10,OTR1
 J OTR
 OTT J 0
 LMJ 4,\$+4
 +0250421042104
 +0210421042103
 +0525252525252
 LMJ 3,PCID
 +TTL,0
 LA 26,TTL
 ANA 26,LTRT3

	LX	10,M117
	SA	26,TTL
OTT1	NOP	
	LA	26,TTL,10
	SM	26,TTL,10
	JMGI	10,OTT1
	J	OTT
OTW	J	0
	LMJ	4,\$+4
		+0052400000000
		+0
		+0660000000000
	LMJ	3,PCID
		+X,ERIND
	LA	26,X
	SLJ	DCD
	SA	26,X
	J	OTW
DCD	J	0
	SX	10,0104
	LX	10,NOQ
DCD1	TNZ	NOQ,,01
	J	DCD1A-1
	TNE	26,QXTBL,10
	J	DCD2
	JMGI	10,DCD1
	AA	26,KEY
DCD1A	AA	26,ABANK
	LX	10,0104
	TG	26,BBNK3
	J	ATL
	J	DCD
DCD2	LA	26,QXTBL+1,10
	J	DCD1A
DCDK	+	0
LOC	J	0
	LA	15,L
	TG	15,BOUND,,01
	J	LTL
	SA	26,0,15
	AA	15,1,,016
	SA	15,L
	J	LOC
OP		+0
X		+0
Y		+0
Z		+0
W		+0
W1		+0
W2		+0
W3		+0
W4		+0
W5		+0
W6		+0
W7		+0
W8		+0
W9		+0
W10		+0
W11		+0
W12		+0
W13		+0
W14		+0
KEY		+0
U		+0

PRVOP	+0	
XP	+0	
ALDT	TZ	GUARD,,010
	J	\$-1
	LX	2,BUFF
	LA	17,0,3
	AX	3,1,,015
	SA	17,ALDT3+1
	SX	3,4
	LA	17,1,,017
	TZ	SW1
	J	ALDC
	SA	17,GUARD,,010
	LA	18,CRDT
	SA	18,CR22
	LA	18,LICC
	SA	18,I05
	LA	18,LFCC
	SA	18,I05+1
	TNZ	TSIG,,010
	J	ALDT1
EXA21	EX	I05
	EX	I05+1
	W	
	SZ	TSIG,,010
ALDT1	TNZ	TSIG,,011
	J	ALDT2
	LX	1,1,,017
	J	RDIO
ALDT2	NOP	
	LA	18,IRCD,2
	SA	18,RCRDE,2
	SZ	IRCD,2
	JMGI	2,ALDT2
EXA22	EX	I05
	EX	I05+1
	W	
ALDT3	LMJ	3,PCID
	+OP,ERIND	
	J	0,4
CRDNT	LA	19,201,,015
	SX	5,CDRAR,,01
	SSL	19,2
	TNE	19,010,,016
	J	SW10
	SA	19,CSIG
	TNE	19,016,,016
	J	SW16
	TNE	19,017,,016
	J	SW17
	TE	19,013,,016
	J	BADF
	SLJ	CRGE
	LA	20,CRDN1+1
	LA	19,CRDN1
BADCD	SLJ	IOTYP
	LA	20,CRDN3
	SLJ	ALTER
	LA	19,WORD
	LA	20,CARD
	SLJ	IOTYP
	LMJ	7,STALL
	AAIJ	ALDC

SW16	SLJ	CRGE
	LA	20,CRDN2+1
	LA	19,CRDN2
	J	BADCD
SW17	LA	12,0201,,016
	LMJ	7,TNTRK
	AAIJ	ALDC
SW10	LA	19,CRDN3
	AA	19,1,,016
	SA	19,CRDN3
CDRAR	LX	5,0,,015
	DIC	12
	AAIJ	0,5
LDC	TOP	16,ZPC
	J	4,4
	JP	16,\$+2
	J	4,4
	SA	16,COUNT
	LA	17,0,4
	AX	4,1,,015
	SA	17,LDC3A+1,,02
	SSL	17,18
	SA	17,LDC3A+1,,01
	AA	17,1,,016
	MSI	17,TREY
	SA	17,ANX4C,,01
ALDC	TNZ	CSIG,,010
	J	CID
	AX	3,1,,015
	LIC	12,CRGV1
	LFC	12,CRGV2
	W	
	SZ	CSIG
CID	SX	3,CID2A,,1
	LX	1,P1Z
	LX	3,M1P19
	NOP	
	SZ	RCRDE,3
	JMGI	3,\$-2
CID0	LA	014,ICR3,1
	SA	014,CID5
	LX	11,P1Z
CID1	LA	014,CID5
	DSL	014,Q36
	SA	015,CID5
	AA	014,TBL3C,,016
	SA	014,CID2,,1
	NOP	
CID2	LA	023,0
	LMJ	3,CID3
	TLEM	11,5,,016
	J	CID1
	TLEM	1,11,,016
	J	CID0
CID2A	LX	3,0,,015
ALDC2	LIC	12,CRGV1
	LFC	12,CRGV2
	W	
	TZ	OCIND
	J	ALDT3
LDC3A	LMJ	3,PCID
	+J	
	LA	16,COUNT
	FAN	16,FL1

	TOP	16,ZPC	
	J	0,4	
	SA	16,COUNT	
	LA	18,NUMEF	
	SA	18,LDC3A+1,,02	
ANX4C	ANX	4,3,,015	
	J	ALDC	
CID3	SX	3,CID4,,01	
	SZ	024	
	EX	CID5,11	
	SZ	025	
	OR	024,RCRDE,1	
	SA	025,RCRDE,1	
CID4	J		
CID5	DSL	023,6	
	DSL	023,12	
	DSL	023,18	
	DSL	023,24	
	DSL	023,30	
	DSL	023,36	
CID6	+	0	
NTCH2	PACI		
	LA	19,MODE	
	LX	6,XR22	
	J	ALT	
NTCH3	PACI		
	LA	19,MODE+1	
	LX	6,XR23	
	J	ALT	
NTCH4	PACI		
	LA	19,MODE+2	
	LX	6,XR24	
ALT	SA	19,MODEI	
	LA	19,CUIA,6	
	SA	19,SCUIA.	STORE CUIA
	SX	6,SCUIA+1.	STORE XR2N
	SX	5,SCUIA+2.	STORE PROGRAM LOCATION
	SZ	6	
ALTIJ	LX	6,SCUIA,,015	
	SX	6,DIC,,010	
	SX	6,DOC,,010	
	AX	6,M2	
	LA	18,201,,015	
	AND	18,IMASK	
	SA	19,SWSTR	
	SSL	19,2	
	TE	19,010,,016	
	J	TSTMD	
SW40	LA	19,INTWD,6	
	SA	19,130,5	
	LA	19,MODEI	
	JZ	19,DIC	
DOC	DOC	0	
	J	\$+2	
DIC	DIC	0	
	EX	SZG,6	
	LX	5,SCUIA+2	
	AACI		
	AAIJ	0,5.	RETURN TO PROGRAM
TSTMD	TZ	MODEI	
	J	OUTPT	
	LA	18,201,,015	
	AND	18,IMASK	
	TNE	19,054,,016	

	J	LGE0F	
	TNE	19,044,,016	
	J	LGERR	
	TNE	19,050,,016	
	J	LGERR	
	TNE	19,074,,016	
	J	NTRLK-3	
	TNE	19,070,,016	
	J	SW40	
	TNE	19,034,,016	
	J	BADF	
	TNE	19,024,,016	
	J	NTRLK	
LGE0F	LMJ	7,MFAIL	
	LX	5,SCUIA+1	
	LA	19,1,,017	
	SA	19,TSIGA,5,011	
	J	SW40	
LGERR	LX	5,SCUIA+1	
	LA	19,1,,017	
	SA	19,TSIGA,5,012	
	J	SW40	
LGE0T	LX	5,SCUIA+1	
	LA	19,01,,017	
	SA	19,TSIGA,5,013	
	J	SW40	
	LA	12,SCUIA,,015	
	SSC	12,30	
	J	SW40	
NTRLK	LMJ	7,TNTRK	
	LX	5,6	
	LA	19,JALT	
	SA	19,130,5	
	EX	ACI,6	
	AX	5,5	
	AAIJ	\$+1	
	EX	I05,5.	EXECUTE I/O
	EX	I05+1,5	
	W		
OUTPT	LA	18,201,,015	
	AND	18,IMAS<	
	TNE	19,044,,016	
	J	WRTER	
	TNE	19,050,,016	
	J	WRTER	
	TNE	19,070,,016	
	J	WRTER	
	TNE	19,074,,016	
	J	NTFLT-3	
	TNE	19,060,,016	
	J	LGE0T	
	TNE	19,024,,016	
	J	NTFLT	
	TNE	19,034,,016	
	J	BADF	
WRTER	LMJ	7,MFAIL	
	LA	19,BSPK.	ERROR REPEAT COUNTER
	AA	19,1	
	TNE	19,06,016	
	LMJ	7,TFAIL	
	SA	19,BSPK	
	LA	19,JA	
	SA	19,130,5	
	LA	19,SCUIA,,02	

	AH	19,BSP	
	SA	19,BSPF	
	AND	19,SKPIT	
	SA	20,SKPF	
	EX	ACI,6	
	AAIJ	\$+1	
	EX	LFC,6.	BACKSPACE BLOCK
	W		
A	LA	18,201,,015	
	AND	18,IMASK	
	TNE	19,040,,016	
	J	SKIP	
	TE	19,060,,016	
	LMJ	7,MFAIL	
SKIP	LA	19,J8	
	SA	19,130,5	
	EX	ACI,6	
	AAIJ	\$+1	
	EX	LFC+3,6.	SKIP AND ERASE
	W		
B	LA	18,201,,015	
	AND	18,IMASK	
	TNE	19,044,,016	
	J	WRTER	
	SZ	BSPK	
	TNE	19,040,,016	
	J	NTFLT	
	TE	19,060,,016	
	LMJ	7,MFAIL	
	LA	19,1,,017	
	SA	19,TSIGA,,013	
	LA	12,SCUIA,,015	
	SSC	12,30	
	LMJ	7,TNTRK	
NTFLT	LX	6,SCUIA,,015	
	ANX	6,2,,015	
	LA	19,JALT	
	SA	19,130,5	
	EX	ACI,6	
	LX	5,6	
	AX	5,6	
	AAIJ	\$+1	
	EX	I05,5.	EXECUTE REMOTE I/O
	NDP		
	EX	I05+1,5	
	W		
SWSTR	+0		
IMASK	+074		
LDT	SZ	0100000-XERF	
	LA	17,0,4	
	AX	4,1,,015	
	SA	17,LDT3A+1,,02	
	SSL	17,18	
	SA	17,LDT3A+1,,01	
	AA	17,1,,016	
	MSI	17,TREY	
	SA	17,ANX4A,,01	
	LA	17,1,,017	
	SX	4,WRTX4	
	LX	3,P1Z	
	LA	18,15	
	SSL	18,036	
	AA	18,LGIN	
	SA	18,\$+2	

	NOP	
	NOP	. LA 19,LJ
	SA	18,LTG
	NOP	
LTG	NOP	
LC2	SA	17,GUARD,,010
	SZ	MODE
	LA	18,LIC2
	SA	18,I05
	LA	18,LFC2
	SA	18,I05+1
	SA	15,GWV1,,1
	LA	18,20,,016
	SA	18,GWV1,,02
	SA	15,LDT2C,,1
	SA	15,LDT2C+1,,1
	SSL	15,18
	JNZ	16,LC2B
	SA	15,BSF,,5
	LA	18,GWV11
	AA	18,2,,017
	SA	18,GWVA
	LA	18,NOP
	SA	18,I05
LI02	EX	I05+1
	SX	2,XR22
	W	
LC2A	SA	16,TSIGA,2
	SA	17,TSIGA,2,010
	J	3,4
LC2B	JP	16,LC2D
	LMA	18,020
	SMA	18,020
	SA	15,BSR,,5
	LA	18,GWV11
	ANA	18,1,,017
	SA	18,GWVA
	LA	18,NOP
	SA	18,I05
	TZ	TSIGA,2,010
	J	LC2C
	EX	I05+1
	SX	2,XR22
	W	
LC2C	SA	17,GUARD,,010
	EX	I05+1
	SX	2,XR22
	W	
	FAN	16,FL1
	TEP	16,ZPC
	J	LC2C
	SZ	020
	J	LC2A
LC2D	LA	18,GWV11
	SA	18,GWVA
	SA	15,RD,,5
	LA	18,I0X1
	SA	18,XLI0
	SA	18,XLI01
	LA	18,LIO2
	SA	18,XLI0+1
	SA	18,XLI01+1
	LA	18,LIO2+1
	SA	18,XLI0+2

	SA	18,XLIO1+2
	LA	18,JIC2
	SA	18,XLIO+3
	SA	18,XLIO1+3
	J	LDI2
LC3	SA	17,GUARD,,011
	SZ	MODE+1
	LA	18,LIC3
	SA	18,I05+2
	LA	18,LFC3
	SA	18,I05+3
	SA	15,GWV2,,1
	LA	18,20,,016
	SA	18,GWV2,,02
	SA	15,LDI2C,,1
	SA	15,LDI2C+1,,1
	SSL	15,18
	JNZ	16,LC3B
LCB3	SA	15,BSF1,,5
	LA	18,GWV12
	AA	18,2,,017
	SA	18,GWVB
	LA	18,NOP
	SA	18,I05+2
LIO3	EX	I05+3
	SX	2,XR23
	W	
LC3A	SA	16,TSIGA,2
	SA	17,TSIGA,2,010
	J	3,4
LC3B	JP	16,LC3D
	LMA	18,020
	SMA	18,020
	SA	15,BSR1,,5
	LA	18,GWV12
	ANA	18,1,,017
	SA	18,GWVB
	LA	18,NOP
	SA	18,I05+2
	TZ	TSIGA,2,010
	J	LC3C
	EX	I05+3
	SX	2,XR23
	W	
LC3C	SA	17,GUARD,,011
	EX	I05+3
	SX	2,XR23
	W	
	FAN	16,FL1
	TEP	16,ZPC
	J	LC3C
	SZ	020
	J	LC3A
LC3D	LA	18,GWV12
	SA	18,GWVB
	SA	15,RD1,,5
	LA	18,IOX1+1
	SA	18,XLIO
	SA	18,XLIO1
	LA	18,IOX+1
	SA	18,XLIO+1
	SA	18,XLIO1+1
	LA	18,LIO3+1
	SA	18,XLIO+2

	SA	18,XLIO1+2
	LA	18,JIC3
	SA	18,XLIO+3
	SA	18,XLIO1+3
	J	LDT2
LC4	SA	17,GUARD,,012
	SZ	MODE+2
	LA	18,LIC4
	SA	18,I05+4
	LA	18,LFC4
	SA	18,I05+5
	SA	15,GWV3,,1
	LA	18,20,,016
	SA	18,GWV3,,02
	SA	15,LDT2C,,1
	SA	15,LDT2C+1,,1
	SSL	15,18
	JNZ	16,LC4B
LCB4	SA	15,BSF2,,5
	LA	18,GWV13
	AA	18,2,,017
	SA	18,GWVC
	LA	18,NOP
	SA	18,I05+4
LIO4	EX	I05+5
	SX	2,XR24
	W	
LC4A	SA	16,TSIGA,2
	SA	17,TSIGA,2,010
	J	3,4
LC4B	JP	16,LC4D
	LMA	18,020
	SMA	18,020
	SA	15,BSR2,,5
	LA	18,GWV13
	ANA	18,1,,017
	SA	18,GWVC
	LA	18,NOP
	SA	18,I05+4
	TZ	TSIGA,2,010
	J	LC4C
	EX	I05+5
	SX	2,XR24
	W	
LC4C	SA	17,GUARD,,012
	EX	I05+5
	SX	2,XR24
	W	
	FAN	16,FL1
	TEP	16,ZPC
	J	LC4C
	SZ	020
	J	LC4A
LC4D	LA	18,GWV13
	SA	18,GWVC
	SA	15,RD2,,5
	LA	18,I0X1+2
	SA	18,XLIO
	SA	18,XLIO1
	LA	18,I0X+2
	SA	18,XLIO+1
	SA	18,XLIO1+1
	LA	18,LIO4+1
	SA	18,XLIO+2

	SA	18,XLI01+2	
	LA	18,JIC4	
	SA	18,XLI0+3	
	SA	18,XLI01+3	
LDT2	TNZ	TSIGA,2,010	
	J	LDT2A	
XLIO1	RES	4	
	SZ	TSIGA,2,010	
LDT2A	NOP		
LDT2B	TNZ	TSIGA,2,011	. TEST EOF
	J	LD2B	
	SZ	TSIGA,2,011	
	LA	18,FL2	
	SNA	18,010000-XERF	
	SA	17,TSIGA,2,010	
EROUT	J	3,4	
LD2B	TNZ	TSIGA,2,012	. ERROR TEST
	J	LDT2C	
	SZ	TSIGA,2,012	
	LA	18,FL1	
	SNA	18,010000-XERF	
	J	EROUT	
LDT2C	LA	18,\$,3	
	SZ	\$,3	
	SA	18,RCRDE,3	
	TLEM	3,19,,016	
	J	LDT2C	
XLIO	RES	4	
	SA	16,COUNT	
LDT3A	LMJ	3,PCID	
	+0		
	SX	4,WRTX4	
	LA	18,NUMEF	
	SA	18,LDT3A+1,,02	
	LX	3,P1Z	
	LA	16,COUNT	
	FAN	16,FL1	
	TOP	16,ZPC	
	J	0,4	
ANX4A	ANX	4,3,,015	
	J	LDT2A	
PRYNT	LA	17,1,,016	
	SA	17,PRSI3	
WRT	SZ	0100000-XERF	
	LA	17,1,,016	
	SA	16,COUNT	
	SA	15,WRTX5	
	TNZ	NTRSG	
	J	WRT0	
	SX	4,WRTX4	
	LX	4,TDELQ	
	LMJ	3,PCIE	
	+1,TITLE		
	LA	16,COUNT	
	LX	4,BUFF	
	SZ	NTRSG	
WRT1	NOP		
	LA	18,RCRDE,4	
	SA	18,TRCRD,4	
	JMGI	4,WRT1	
	LX	4,WRTX4	
WRT0	SZ	034	
	LA	15,WRTX5	
	LA	18,0,4	

	AX	4,1,,015	
	SA	18,WRT24+1	
	SSL	18,18	
	AA	18,1,,016	
	MSI	18,TREY	
	SA	18,ANX43,,01	
	TNZ	TSIGA,2,013	
	J	ALPH1	
	LNA	18,FL3	
	SA	18,0100000-XERF	
	SZ	TSIGA,2,013	
	J	3,4	
ALPH1	LA	18,15	
	SSL	18,036	
	AA	18,GINST	
	SA	18,\$+2	
	NOP		
	NOP		. LA 7,J
	SA	18,JTG	
	NOP		
JTG	NOP		
C2	SA	17,GUARD,,010	
	SA	17,MODE	
	LA	18,LFC2	
	SA	18,I05	
	LA	18,LOC2	
	SA	18,I05+1	
	SA	15,GWV1,,1	
	SA	15,WRT3C,,1	
	SSL	15,18	
	TZ	TSIGA,2,010	. TEST FOR BSR BEFORE WRITE
	J	C2A	
	SA	15,BSR,,5	
	LA	18,GWV11	
	ANA	18,021	
	SA	18,GWVA	
C2I0	EX	I05	
	SX	2,XR22	
	W		
	SA	17,TSIGA,2,010	
C2A	JNZ	16,C2B	. COUNT
	SA	15,WEF,,5	
	LA	18,GWV14	
	ANA	18,021	
	SA	18,GWVA	
	LA	18,NOP	
	SA	18,I05+1	
	EX	I05	
	SX	2,XR22	
	W		
	J	3,4	
C2B	JP	16,C2C	
	SA	15,REW,,5	
	LA	18,GWV14	
	AA	18,2,,017	
	SA	18,GWVA	
	LA	18,NOP	
	SA	18,I05+1	
	EX	I05	
	SX	2,XR22	
	W		
	SA	17,TSIGA,2,010	
	J	3,4	

C2C	SA	15,WD,,05	
	LA	18,GWV14	
	SA	18,GWVA	
	LA	18,C2IO	
	SA	18,XIO	
	LA	18,IOX	
	SA	18,XIO+3	
	LA	18,NOP	
	SA	18,XIO+2	
	LA	18,JOC2	
	SA	18,XIO+4	
	LA	18,C2IO+1	
	SA	18,XIO+1	
	J	WRT2	
C3	SA	17,GUARD,,011	
	SA	17,MODE+2	
	LA	18,LFC3	
	SA	18,IO5+2	
	LA	18,LOC3	
	SA	18,IO5+3	
	SA	15,GWV2,,1	
	SA	15,WRT3C,,1	
	SSL	15,18	
	TZ	TSIGA,2,010	
	J	C3A	
	SA	15,BSR1,,5	
	LA	18,GWV12	
	ANA	18,021	
	SA	18,GWVB	
C3IO	EX	IO5+2	
	SX	2,XR23	
	W		
	SA	17,TSIGA,2,010	
C3A	JNZ	16,C3B	. COUNT
	SA	15,WEF1,,5	
	LA	18,GWV15	
	ANA	18,021	
	SA	18,GWVB	
	LA	18,NOP	
	SA	18,IO5+3	
	EX	IO5+2	
	SX	2,XR23	
	W		
	J	3,4	
C3B	JP	16,C3C	
	SA	15,REW1,,5	
	LA	18,GWV15	
	AA	18,2,,017	
	SA	18,GWVB	
	LA	18,NOP	
	SA	18,IO5+3	
	EX	IO5+2	
	SX	2,XR23	
	W		
	SA	17,TSIGA,2,010	
	J	3,4	
C3C	SA	15,WD1,,5	
	LA	18,GWV15	
	SA	18,GWVB	
	LA	18,C3IO	
	SA	18,XIO	
	LA	18,C3IO+1	
	SA	18,XIO+1	
	LA	18,NOP	

	SA	18,X10+2
	LA	18,JOC3
	SA	18,X10+4
	LA	18,IOX+1
	SA	18,X10+3
	J	WRT2
C4	SA	17,GUARD,,012
	SA	17,MODE+2
	LA	18,LFC4
	SA	18,IO5+4
	LA	18,LOC4
	SA	18,IO5+5
	SA	15,GWV3,,1
	SA	15,WRT3C,,1
	SSL	15,18
	TZ	TSIGA,2,010
	J	C4A
	SA	15,BSR2,,5
	LA	18,GWV13
	ANA	18,021
	SA	18,GWVC
C4IO	EX	IO5+4
	SX	2,XR24
	W	
	SA	17,TSIGA,2,010
C4A	JNZ	16,C4B
	SA	15,WEF2,,5
	LA	18,GWV15
	ANA	18,021
	SA	18,GWVC
	LA	18,NOP
	SA	18,IO5+5
	EX	IO5+4
	SX	2,XR24
	W	
	J	3,4
C4B	JP	16,C4C
	SA	15,REW2,,5
	LA	18,GWV15
	AA	18,2,,017
	SA	18,GWVC
	LA	18,NOP
	SA	18,IO5+5
	EX	IO5+4
	SX	2,XR24
	W	
	SA	17,TSIGA,2,010
	J	3,4
C4C	SA	15,WD2,,05
	LA	18,GWV15
	SA	18,GWVC
	LA	18,C4IO
	SA	18,XIO
	LA	18,C4IO+1
	SA	18,XIO+1
	LA	18,NOP
	SA	18,XIO+2
	LA	18,IOX+2
	SA	18,XIO+3
	LA	18,JOC4
	SA	18,XIO+4
WRT2	NOP	
WRT2A	LMJ	3,PCIE
	+0	

	SX	4,WRTX4
	LA	18,ALF,,1
	SA	18,WRT24+1,,1
	LA	21,IBIT
	OR	21,WRT3C
	SA	22,WRT3C
	LX	3,PIZ
	LX	4,BUFF
WRT3	LA	21,TRCRD,3
	OR	21,RCRDF,3
	SA	22,RCRDF,3
	LA	21,020,,016
	TNZ	RCRDF,3,015
	SA	21,RCRDF,3,015
	TNZ	RCRDF,3,014
	SA	21,RCRDF,3,014
	TNZ	RCRDF,3,013
	SA	21,RCRDF,3,013
	TNZ	RCRDF,3,012
	SA	21,RCRDF,3,012
	TNZ	RCRDF,3,011
	SA	21,RCRDF,3,011
	TNZ	RCRDF,3,010
	SA	21,RCRDF,3,010
	LA	22,RCRDF,3
WRT3C	SA	22,*,*3
	JMGI	4,WRT3
	TZ	PRSIG
	J	PRINT
XIO	RES	5
	FAN	16,FL1
	LX	4,WRTX4
	TOP	16,ZPC
	J	WRT4
	LA	18,TSIGA,2,013
	AA	18,034
	SA	18,034
ANX4B	ANX	4,3,,015
	J	WRT2
WRT4	SZ	PRSIG
	TNZ	TSIGA,2,013
	J	0,4
	LA	18,FL3
	SNA	18,0100000-XERF
	J	0,4
LOCAT	J	\$
R1	EQU	0101
	LR	R1,0100,,016
	LX	12,M1P63
	NOP	
	SE	25,TBL3C,*12
	LX	12,4,,016
	AX	12,1,,016
	J	LOCAT
PRINT	LX	8,M1P19
	NOP	
	LA	25,OPRIN,8,015
	SLJ	LOCAT
	SA	12,OPRIN,8,015
	LA	25,OPRIN,8,014
	SLJ	LOCAT
	SA	12,OPRIN,8,014
	LA	25,OPRIN,8,013

. JUMP, COUNT IS ZERO

	SLJ	LOCAT	
	SA	12,OPRIN,8,013	
	LA	25,OPRIN,8,012	
	SLJ	LOCAT	
	SA	12,OPRIN,8,012	
	LA	25,OPRIN,8,011	
	SLJ	LOCAT	
	SA	12,OPRIN,8,011	
	LA	25,OPRIN,8,010	
	SLJ	LOCAT	
	SA	12,OPRIN,8,010	
PROUT	JMGI	8,PRINT+1	
	LFC	13,GWVPA	
	NOP		
	LOC	13,GWVP3	
	W		
PRLCK	DUC	13	
	LA	19,201,,015	
	SSL	19,2	
	TNE	19,010,,016	
	AAIJ	X10+5	
	TE	19,017,,016	
	LMJ	7,MFAIL	
	LA	12,0301,,016	
	LMJ	7,TNTRK	
	AAIJ	PROUT	
MIP63	-1,63		
GWVPA	+1,\$+1		
	+J120001000001		
GWVPB	+22,OPRIN		
PRSIG	+J		
LBT	SZ	010000-XERF	
	LA	16,0,4	. STORE X AND Y
	SA	16,MAG,,1	
	SA	16,FCM,,1	
	SSL	16,18	
	SA	16,LAX,,1	
	SA	16,ARGX,,1	. X
	SA	16,LNA,,1	
	SA	16,SAX,,1	
	LA	17,CH265	
FCM	FA	17,\$	
	SA	18,LXY,,1	
	SA	18,ARGX,,2	
MAG	LA	16,\$	
	LA	17,1,,017	
	LA	18,15	
	SSL	18,036	
	AA	18,BGIN	
	SA	18,\$+2	
	SSL	15,18	
	NOP		
	SA	18,LGT	
	NOP		
LGT	J	\$	
LBC2	SA	17,GUARD,,010	
	SZ	MODE	
	LA	18,LIC2	
	SA	18,I05	
	LA	18,LFC2	
	SA	18,I05+1	
	LA	18,ARGX	
	SA	18,GWV1	
	JNZ	16,LBC23	

	SA	15,BSF,,5	
	LA	18,GWV11	
	AA	18,2,,016	
	SA	18,GWVA	
	LA	18,NOP	
	SA	18,I05	
LBI0	EX	I05+1	
	SX	2,XR22	
	W		
LBC2A	SA	16,TSIGA,2	
	SA	17,TSIGA,2,010	
	J	1,4	
LBC2B	JP	16,LBC2D	
	J	LC2B+1	. JUMP TO BSR.
LBC2D	LA	18,GWV11	
	AA	18,17	
	SA	18,GWVA	
	SA	15,RB,,5	
	LA	18,IOX1	. EX I05
	SA	18,XBI	
	LA	18,XRC2	
	SA	18,XBI+1	
	LA	18,IOX	
	SA	18,XBI+2	
	LA	18,JIC2	
	SA	18,XBI+3	
	J	LBT2	
LBC3	SA	17,GUARD,,011	
	SZ	MODE+1	
	LA	18,LIC3	
	SA	18,I05+2	
	LA	18,LFC3	
	SA	18,I05+3	
	LA	18,ARGX	
	SA	18,GWV2	
	JNZ	16,LBC3A	
	J	LCB3	
LBC3A	JP	16,LBC33	
	J	LC3B+1	
LBC3B	LA	18,GWV12	
	AA	18,17	
	SA	18,GWVB	
	SA	15,RB1,,5	
	LA	18,IOX1+1	
	SA	18,XBI	
	LA	18,XRC3	
	SA	18,XBI+1	
	LA	18,IOX+1	
	SA	18,XBI+2	
	LA	18,JIC3	
	SA	18,XBI+3	
	J	LBT2	
LBC4	SA	17,GUARD,,012	
	SZ	MODE+2	
	LA	18,LIC4	
	SA	18,I05+4	
	LA	18,LFC4	
	SA	18,I05+5	
	LA	18,ARGX	
	SA	18,GWV3	
	JNZ	16,LBC4A	
	J	LCB4	
LBC4A	JP	16,LBC43	
	J	LC4B+1	

LBC4B	LA	18,GWV13	
	AA	18,17	
	SA	18,GWVC	
	SA	15,RB2,,5	
	LA	18,IOX1+2	
	SA	18,XBI	
	LA	18,XRC4	
	SA	18,XBI+1	
	LA	18,IOX+2	
	SA	18,XBI+2	
	LA	18,JIC4	
	SA	18,XBI+3	
LBT2	NOP		
XBI	RES	4	
	TNZ	TSIGA,2,011	. EOF TEST
	J	LBT2A	
	LA	18,FL2	
	SNA	18,0100000-XERF	
	J	1,4	
LBT2A	TNZ	TSIGA,2,012	. ERR TEST
	J	COMP2	
	LA	18,FL1	
	SNA	18,0100000-XERF	
COMP2	LX	3,LX6	
	NOP		
LAX	LA	26,\$,3	
	JP	26,\$+3	
LNA	LNA	26,\$	
	OR	26,SIGN	
SAX	SA	26,\$,3	
	TLEM	3,LXY	
	J	LAX	
	J	1,4	
PBT	SZ	0100000-XERF	
	LA	16,0,4	
	SA	16,AMAG,,01	
	SA	16,AFCM,,01	
	SSL	16,18	
	SA	16,ALAX,,01	
	SA	16,ARGX,,1	X
	SA	16,ASAX,,01	
	SA	16,BRAR4,,01	
	SA	16,BRAR3,,01	
	LA	17,CH265	
AFCM	FA	17,\$	
	SA	18,LXY,,1	
	SA	18,ARGX,,2	
	SA	18,BRARC,,01	
AMAG	LA	16,\$	
	LA	17,+1,,017	
	LA	18,15	
	SSL	18,036	
	AA	18,PGIN	
	SA	18,\$+2	
	NOP		
	NOP		
	SA	18,PTG	
PTG	SSL	15,18	
PC2	J	\$	
	SA	17,GUARD,,010	
	SA	17,MODE	
	LA	18,LOC2	
	SA	18,105+1	
	LA	18,LFC2	

	SA	18,IO5
	LA	18,ARGX
	SA	18,GWV1
	JNZ	16,PC2A
	SA	15,WEF,,5
	LA	18,GWV14
	ANA	18,17
	SA	18,GWVA
PC2W	LA	18,NOP
	SA	18,IO5+1
	EX	IO5
	SX	2,XR22
	W	
	J	1,4
PC2A	JP	16,PC2B
	SA	15,REW,,5
	LA	18,GWV14
	AA	18,2,,016
	SA	18,GWVA
	J	PC2W
PC2B	SA	15,WB,,5
	LA	18,GWV14
	AA	18,17
	SA	18,GWVA
	LA	18,IOX1
	SA	18,XIOP
	LA	18,XRC2
	SA	18,XIOP+1
	LA	18,IOX
	SA	18,XIOP+2
	LA	18,JOC2
	SA	18,XIOP+3
	J	PBT2
PC3	SA	17,GUARD,,011
	SA	17,MODE+1
	LA	18,LFC3
	SA	18,IO5+2
	LA	18,LOC3
	SA	18,IO5+3
	LA	18,ARGX
	SA	18,GWV2
	JNZ	16,PC3A
	SA	15,WEF1,,5
	LA	18,GWV15
	ANA	18,17
	SA	18,GWVB
PC3W	LA	18,NOP
	SA	18,IO5+3
	EX	IO5+2
	SX	2,XR23
	W	
	J	1,4
PC3A	JP	16,PC3B
	SA	15,REW1,,5
	LA	18,GWV15
	AA	18,2,,016
	SA	18,GWVB
	J	PC3W
PC3B	SA	15,WB1,,5
	LA	18,GWV15
	AA	18,17
	SA	18,GWVB
	LA	18,IOX1+1
	SA	18,XIOP

. Y = OF WORDS (W)

	LA	18,XRC3
	SA	18,XIOP+1
	LA	18,IOX+1
	SA	18,XIOP+2
	LA	18,JOC3
	SA	18,XIOP+3
	J	PBT2
PC4	SA	17,GUARD,,012
	SA	17,MODE+2
	LA	18,LFC4
	SA	18,IO5+4
	LA	18,LOC4
	SA	18,IO5+5
	LA	18,ARGX
	SA	18,GWV3
	JNZ	16,PC4A
	SA	15,WEF2,,5
	LA	18,GWV15
	ANA	18,17
	SA	18,GWVC
PC4W	LA	18,NOP
	SA	19,IO5+5
	EX	IO5+4
	SX	2,XR24
	W	
	J	1,4
PC4A	JP	16,PC4B
	SA	15,REW2,,5
	LA	18,GWV15
	AA	18,2,,016
	SA	18,GWVC
	J	PC4W
PC4B	SA	15,WB2,,5
	LA	18,GWV15
	AA	18,17
	SA	18,GWVC
	LA	18,IOX1+2
	SA	18,XIOP
	LA	18,XRC4
	SA	18,XIOP+1
	LA	18,IOX+2
	SA	18,XIOP+2
	LA	18,JOC4
	SA	18,XIOP+3
PBT2	J	\$+1
COMPL	LX	3,LX6
	NOP	
ALAX	LA	26,\$,3
	JP	26,\$+3
	LNA	25,26
	OR	25,SIGN
ASAX	SA	26,\$,3
	TLEM	3,LXY
	J	ALAX
XIOP	RES	4
	TNZ	TSIGA,2,,013
	J	BRARW
	LA	18,FL3
	SNA	18,0100000-XERF
BRARW	LX	3,BRARC
	NOP	
BRARA	LX	18,0,3
	JP	18,BRAR3+1

	SN	18,17
	OR	17,SIGN
BRARB	SA	18,0,3
	JMGI	3,BRARW+1
	J	1,4
BRARC	-1,0	
LXY	+0,0	
LX6	+1,0	
SIGN	+040000000000	
WRTX5	+0	
.		PCIE
PCIE	J	PCIEA
RCRDF	RES	20
PCIEA	SX	3,PCIEA+1,,1
	NOP	
	LA	014,PCIEA+1,,1
	AA	014,+1,,016
	SA	014,RAR,,1
	LA	014,0,3
	LX	3,MIP19
	SA	014,SGN,0,1
	SA	014,NUM,0,1
	SA	014,ALF,0,1
	SA	014,FULL,0,1
	DSL	014,18
	SA	014,TCB
	NOP	
	SZ	RCRDF,3
	JMGI	3,\$-2
	SZ	CNO
	SZ	WNO
	SZ	FLONO
PCIEB	LMJ	11,DR
	TNZ	N
	J	RAR
	LA	015,N
	SA	015,N+1
	LA	015,MIM1
	AH	015,N
	SA	015,N
	LX	11,N
	LA	015,K
	JZ	015,FULL
	TNE	015,TREY
	J	SKP
	TNE	015,TWO
	J	ALF
SGN	LA	014,FILL
	SZ	023
	TP	014
	LA	023,NEGS
	LMJ	3,CIR\$
NUM	LM	014,FILL
	FA	014,CH256
	AND	015,MASK1
	SA	016,INP
	LA	014,NUM<
	SA	014,UPD1
	J	UPD
NUMK	JMGI	11,NUM1
	J	NUM1
FULL	LM	014,FILL
	FA	014,CH256
	AND	015,MASK1

	SA	016, INP
	LA	014, NUM<
	SA	014, UPD1
NUM1	LA	015, INP
	SZ	014
	DI	014, TBL, 11
	SA	014, WRD
	SA	015, INP
	LA	015, WRD
	LX	1, 015, , 1
	NOP	
	LA	023, CTBL + 90, 1
	LMJ	3, CIR\$
	J	UPD
ALF	LA	014, FILL
	FA	014, CH256
	AND	015, MAS<1
	SA	016, INP
	LA	014, ALF<
	SA	014, UPD1
ALF1	LA	016, INP
	SZ	015
	DI	015, ATBL, 11
	SA	015, WRD
	SA	016, INP
	LA	022, WRD
	AA	022, CTBL, , 016
	SA	022, ALF2, , 01
ALF2	LA	023, 0
	LMJ	3, CIR\$
	J	UPD
ALFK	JMGI	11, ALF1
UPD	LA	017, CNO
	AA	017, ONE
	TG	017, SIX
	LA	017, ZRO
	SA	017, CNO
	TZ	017
	J	UPD1
	LA	017, WNO
	AA	017, ONE
	SA	017, WNO
UPD1	HJ	FILL
	LA	015, SGN
	AA	015, ONE
	SA	015, SGN, 0, 1
	SA	015, NUM, 0, 1
	SA	015, ALF, 0, 1
	SA	015, FULL, 0, 1
	J	PCIEB
SKP	LA	015, CNO
	SZ	014
	AA	015, N+1
	DI	014, SIX
	AA	014, WNO
	SA	014, WNO
	SA	015, CNO
	J	PCIEB
RAR	J	
DR	SX	1, DRX1
	SX	11, DRX, , 01
	LX	1, FLDNO
	NOP	
	JMGI	1, DR1

SIX L CNO

	LA	014,TCB
	JN	014,DRX+1
	LX	1,M1P17
	LA	015,0,4
	SA	015,TEMP1
	LA	015,1,4
	SA	015,TEMP2
	LA	015,2,4
	SA	015,TEMP3
	AX	4,TREY
	LA	014,TCB
	ANA	014,ONE
	SA	014,TCB
DR1	LA	014,TEMP1
	SZ	015
	DSL	014,32
	SA	014,N
	LA	016,TEMP2
	SZ	017
	DSL	016,32
	SA	017,TEMP2
	SZ	017
	DR	016,015
	SA	017,TEMP1
	LA	014,TEMP3
	SZ	015
	DSL	014,34
	SA	014,K
	SA	015,TEMP3
	SX	1,FLDNO
	LX	1,DRX1
DRX	J	
	SZ	N
	J	DRX
TCB	+J	
DRX1	+J	
CIR\$	SX	11,CIRX+1
	SX	3,CIRX,,01
	LX	11,CNO
	SZ	024
	EX	CIR1,11
	LX	11,WNO
	SZ	025
	DR	024,RCRDF,11
	SA	025,RCRDF,11
	LX	11,CIRX+1
CIRX	J	
	NDP	
CIR1	DSL	023,6
	DSL	023,12
	DSL	023,18
	DSL	023,24
	DSL	023,30
	DSL	023,36
CTBL	+	0
	+	0
	+	0
	+	0
	+	0
	+	0
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	+	0
	+	0

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+073	
+074	
+060	
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+	040
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+034	
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+061	
+062	
+063	
+064	
+065	
+066	
+067	
+070	
+071	
+	0
+	041
+	042
+	043

```

+      044
+      045
+      046
+      047
+      050
+      051
+      0
+      0
+022
+023
+024
+025
+026
+027
+030
+031
+      10
+      1
+      2
+      3
+      4
+      5
+      6
+      7
+      8
+      9
.      CONSTANT S
SIX      +      6
NEGS      +      040
TBL      +1
          +10
          +100
+1000
          +10000
          +100000
          +1000000
          +10000000
          +100000000
          +1000000000
ATBL      +1
          +100
          +10000
          +1000000
          +100000000
.      ERASABLE S
FLDNO +      0
TEMP1 +      0
TEMP2 +      0
TEMP3 +      0
K      +      0
N      RES      2
CVD      +      0
WNO      +      0
INP      +      0
WRD      +      0
SHIFT      +      0
TEMP      RES      2
MIM1      -1,-1
MIPZ      -1,0
MASK1      +      000077777777
MIP19      +      -1,19
MIP17      -1,17
          RES      $/2*2+2-$
QXTBL      +0
          END      MYSTIC

```